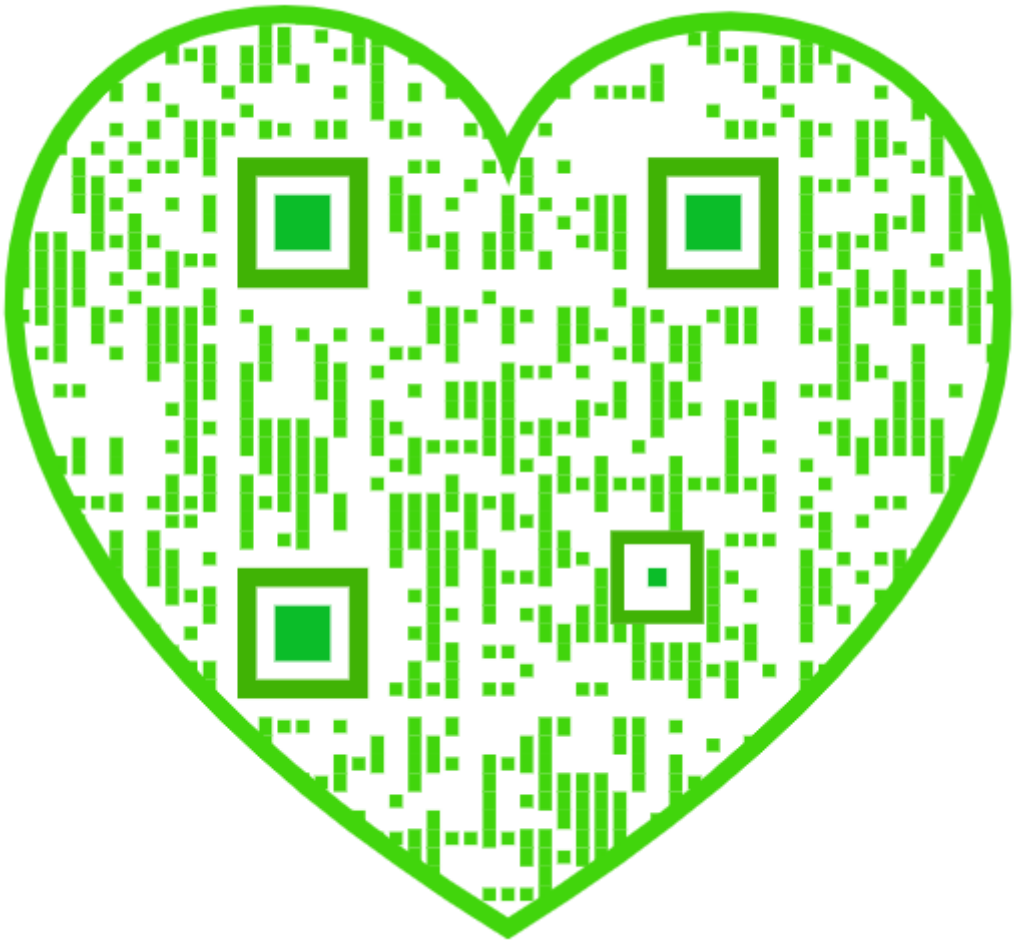


R. A. Doré

MANUAL

SHIP SANITATION

AND

FIRST-AID

FOR MERCHANT SEAMEN

Prepared under the direction of the

Rev. ARCHIBALD R. MANSFIELD, D.D.

Superintendent, Seamen's Church Institute of New York

in co-operation with the

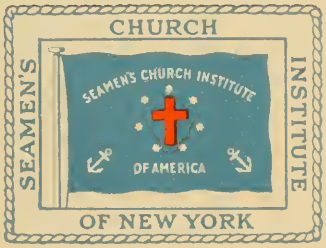
UNITED STATES PUBLIC HEALTH SERVICE

WASHINGTON, D. C.

BY

ROBERT W. HART

Surgeon



THIRD EDITION—WITH ILLUSTRATIONS

SECOND IMPRESSION

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DEDICATED

TO

MERCHANT SEAMEN

PUBLISHER'S NOTE TO THE THIRD EDITION

The extraordinary demand for this unique Marine First Aid publication justifies another and thoroughly revised edition in order that it may continue to retain its place as a standard authority and worthy text book on first aid for the use of the men of the American Merchant Marine.

The author has made a complete revision, having thoroughly re-written and re-arranged the material, adding new matter and illustrations. Especial attention has been given to the important subject of First Aid by Radio (see appendix).

The publisher feels that he should express indebtedness to the author, Dr. Hart, for having produced a manual which has so satisfactorily met the need, and to Dr. C. H. Lavinder of the U. S. Public Health Service for his interest and his valued assistance in the preparation of the book.

The sympathetic approval of the Public Health Service and the personal commendation of Surgeon General H. S. Cumming are deeply appreciated.

Grateful acknowledgment is due the Radio Corporation of America for their splendid co-operation in rendering gratis receiving and broadcasting services. The humanitarian spirit of this Corporation in thus serving the seamen cannot be too emphatically commended.

The publisher is devoutly thankful for the privilege of having been afforded this opportunity to issue a book which represents a sympathetic cooperative effort to assist our brothers while on the Sea.

SEAMEN'S CHURCH INSTITUTE OF NEW YORK

Archibald Romaine Mansfield,
Superintendent.

TREASURY DEPARTMENT

United States Public Health Service

WASHINGTON, D. C.

I am again pleased to comply with the request for a short foreword to the new, third edition, of this manual; and feel that now, more than ever, I can commend the book to the attention of all seafaring men.

It has proven itself to be timely, appropriate, and satisfactory. Its success furnishes abundant evidence of the need for such a book.

May I again direct attention to the legal connection which exists between the American Merchant Marine and the United States Public Health Service, and renew the expression of my belief that the promotion of a spirit of mutual trust and good will between these two groups is a matter of national importance?

As I have pointed out, this manual, in its way, stimulates and promotes an intelligent relationship between these two agencies. It supplies valuable information and gives excellent counsel to masters and others which, if properly heeded, would do much for the maintenance of a sanitary vessel, a healthy crew, and the obviation of delays at quarantine.

This little book is still used by the representatives of the Public Health Service in the teaching of first-aid to masters, mates, pilots and engineers who must have such instruction before being granted original licenses. Examinations continue to be based upon its contents.

It is particularly gratifying to feel that the Public Health

Service and the Seamen's Church Institute of New York have cooperated in this commendable and successful service; and it gives me pleasure to think that this cooperation serves as an indication of the happy association which exists between Dr. Mansfield and myself in our effort to promote the welfare of the Merchant Marine.

H. S. Cumming,
Surgeon General.

October, 1926

PREFACE TO THIRD EDITION

This manual is written in order to furnish officers and men of the merchant marine with a small plainly worded text book which will give them some knowledge of ship sanitation and hygiene, will serve them as a brief guide in simple medicine and surgery, and will aid them in caring for such cases of injury and illness as may occur during a voyage at sea.

The ordinary book on first aid does not answer the purpose, for the ordinary book on first aid contains nothing on ship sanitation, little on hygiene as applicable on board ship, nothing regarding maritime quarantine, and is only sufficient in scope to enable the reader to render *first aid* while awaiting the arrival of the doctor, who, on land, is usually within a few minutes or at most a few hours call of the scene of the illness or accident.

Since a knowledge of the principles of sanitation and hygiene is highly necessary to officers of the merchant marine and an application of this knowledge would time and again save hours or days for the ship by obviating delays in quarantine, Part I of the book is devoted to general sanitation and hygiene, including directions for the prevention of certain diseases. There is also a section on maritime quarantine, its purpose, scope and uses, together with a résumé of the United States Quarantine regulations. Some space is also devoted to the subject of fumigation and disinfection of ship's compartments, blankets, bedding, etc.

Most of the remainder of the book is devoted to simple anatomy, physiology, the principles of medicine, surgery and to first aid.

When illness or accident occur at sea it may be a matter of days or weeks before medical aid is available. For this reason certain items of instruction and certain remedies are included which are usually omitted from books designed for those living where the services of a physician are available within a few hours.

Of the total number of registered vessels sailing the seas, a comparatively small proportion carry medical officers while unfortunately illness and accident are fairly common as one of the hazards of the life. As the care of sick or injured usually devolves on one of the ship's officers, a knowledge of the elements of medicine, surgery and first aid is highly important to officers and men going to sea under such circumstances and results in increased efficiency, less suffering for the crew, and a saving of dollars for the owners.

Because of these conditions, the Secretary of Commerce in 1921 approved the Amendment to Rule V, Section 1 of the General Rules and Regulations prescribed by the Board of Supervising Inspectors, "that no candidate for original license as master, mate, pilot or engineer shall be examined unless he shall present satisfactory evidence to the inspectors that he has completed a course of instruction in the principles of *first aid* approved by the United States Public Health Service, duly attested; that he has passed a satisfactory oral examination based upon the contents of the 'Handbook of the Ship's Medicine Chest' or some other manual arranged for the purpose, having the approval of the United States Public Health Service."

In accordance with this regulation, the U. S. Public Health Service gives courses of instruction in Ship Sanitation and First Aid, followed by examination, in most of those places where licenses for masters, mates, pilots, or engineers are issued.[1]

[1] For full information application should be made to the United States Steamboat Inspection Service, Department of Commerce, Washington, D. C.

Up to the present time this manual, having the approval of the United States Public Health Service, has been used as a text book in giving such instructions. Over 9000 copies of the book have been issued and it is a matter of gratification to the author that the manual has met with such widespread approval. It is believed to have accomplished its purpose in improving what was formerly a very unhappy situation.

The work is couched in language as simple as possible. Technical medical terms have been used only when unavoidable for the sake of clarity and when such terms are used they are explained fully either in the text or in the glossary.

As a result of welcome criticisms by instructors and students, certain changes have been made in the present edition in order to improve the text and to include the most recent additions to medical and surgical knowledge.

A special chapter on Radio Medical Service together with instructions as to the preparation of radiograms requesting medical advice has been added to the appendix.

The author begs to acknowledge his indebtedness to Dr. Mansfield, Superintendent of the Seamen's Church Institute of New York, who is largely responsible for this volume and who has done more to aid in seamen's welfare work than any other living man; also his indebtedness to Senior Surgeon C. H. Lavinder of the United States Public Health Service without whose encouragement and aid this work would never have seen completion.

Robert Watson Hart.

Manila, P. I.
October, 1926

NOTICE

SPECIAL ATTENTION IS CALLED
TO THE SUBJECT OF

FIRST AID BY RADIO

SEE APPENDIX, PAGE 189

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MANUAL ON SHIP SANITATION AND FIRST-AID

PART I

GENERAL SANITATION AND HYGIENE ESPECIALLY AS RELATED TO CONDITIONS ON SHIPBOARD

Causes of Disease

Most diseases are caused by the growth and activity of certain minute living particles, seen only by the aid of a microscope.

Some of these particles are tiny vegetable organisms called germs or bacteria. There are many kinds of bacteria, but, depending on their appearance when seen in the microscope, they are divided into three main classes: cocci (round in shape), bacilli (longer, rod shaped) and spirilla (those shaped like a corkscrew).

There is another group of organisms belonging to the vegetable family some of which may also cause disease. They are the fungi or molds. In many ways these organisms resemble ordinary molds and yeasts.

Still another group of minute organisms which may cause disease, belong to the animal family. They are in fact tiny animals and as a group are called protozoa. The organism which causes malarial fever belongs to this group.

Still higher in the scale of development, we find certain worms, such as the tape worm, which when introduced into the body cause disease.

Many of these organisms, particularly bacteria and molds, exist everywhere in nature. Certain of them, when introduced into the body, may cause disease, while others produce no ill effect. Those which cause disease are known as pathogenic organisms. Those which do not cause disease as non-pathogenic.

These living particles may get into the body in various ways. They may be swallowed, or breathed in, they may be injected into the body by an insect, such as the mosquito or louse, at the time of biting, or they may be introduced into the body through wounds.

Very often it is not the organisms themselves which cause illness but the poisons manufactured by them which, when circulated in the body, cause disease.

There is another group of diseases regarding which we knew almost nothing until recently. They are known as the "deficiency diseases" and are due to a lack of certain food substances or to a lack of certain substances in our food which we call "vitamins." In order that the body may remain healthy we must take into it with our food sufficient amounts of these substances. No one knows exactly how vitamins act to keep us well, we only know that if the food we eat is lacking in vitamins, certain diseases develop. One of the best known of the deficiency diseases is scurvy which was formerly so dreaded by sailors on long voyages at sea but which now, since we have discovered that small amounts of fresh vegetables or fruits or their juices will prevent this disease, is practically never seen. The vitamins necessary to prevent the development of scurvy are contained in the fresh vegetables and fruits.

Still other diseases are caused by the lack of observance of the ordinary rules of correct living; otherwise known as hygiene. For instance, if an individual eats some indiges-

tible substance, this will in all probability bring on a pain in his belly; if he fails to keep his body clean, he may become infected with lice or other vermin which may, in biting, introduce the germs necessary to produce illness.

Remaining Healthy

The observance of certain simple rules is necessary to keep the body healthy and in condition to resist disease, for in spite of anything we may do, some of the germs of disease will gain entrance at times and it is only by keeping ourselves in the best physical condition that the system is enabled to fight off these germs without our becoming ill. *Keep clean inside and out; use only pure water and pure food. Get plenty of fresh air. Take enough exercise. Be moderate in the matter of eating and drinking. Eat sufficient fresh foods to prevent the development of any of the deficiency diseases. Wear suitable clothing. Do not willfully expose yourself to contact with those who are ill with communicable diseases.*

Care of the Bowels (Intestines)

In the previous paragraph we spoke of keeping ourselves clean inside and out. Certain poisons are normally formed in the body. These, together with a large part of the waste left over from our food, are thrown out through the intestines. The intestinal canal acts for the human system just as a sewerage system does for a city. It is highly important therefore that the bowels move freely at least once a day, for if the sewage of the body backs up in the system and is not gotten rid of promptly we become poisoned by it. The bowel can be trained to empty itself at some given time each day if sufficient attention is paid to the matter. If necessary, an occasional mild cathartic should be taken although continued use of cathartics will eventually so injure the sensitiveness of the bowel that there will be no action without one. If

necessary, an injection of a small amount of warm water (with or without soap suds) into the rectum will bring about a bowel movement.

Certain fruits such as prunes, figs, apples and oranges act as mild laxatives and the free use of them will very often do away with the necessity of stronger and more harmful cathartics.

Toilets

In this connection, attention should be directed to seeing that sufficient toilets are provided and that they are kept clean. Certainly, a filthy toilet will not stimulate a person to remain long enough to properly empty the bowel. Toilets should be thoroughly scrubbed daily and this scrubbing should include seats, hoppers, urinal troughs, floors and walls. If this scrubbing process is thoroughly carried out, there will be little necessity for the use of chloride of lime and similar substances in the toilets.

Mouth Hygiene and Care of the Teeth

There is another part of the interior of the body which requires special care and cleanliness if we expect to remain healthy. This is the mouth and more especially the teeth.

Seamen, as a whole, do not take even moderately good care of their teeth. It is rather unusual to see a good set of teeth in a seaman past thirty-five, and many of them are suffering from under-nourishment, the effect of not having sufficient teeth properly to chew their food. A tooth brush used daily once or more times will save many teeth that otherwise would be lost, while a little cleaning and dental work while in port would save many a set of teeth. Each man should go to a dentist at least once a year and have his teeth gone over; have them scraped and cleaned thoroughly and have all cavities filled. Many teeth, even with large cavities, can be saved by careful filling, and properly filled teeth are

more satisfactory than either bridge work or plates. Pyorrhea and shrinking of the gums with exposure of the roots of the teeth, is largely due to neglect of the mouth. The application, along the gum line, of a little tincture of iodine occasionally, the brushing of the teeth with a few drops of tincture of myrrh sprinkled on the tooth brush and a thorough cleansing of the teeth when in port, will aid in the prevention of pyorrhea. Old snags of teeth, especially those with sharp edges, which are irritating the tongue or cheek, should be pulled, as quite frequently, through irritation, they cause the growth of a cancer on the tongue, lip or cheek.

Blind abscesses at the roots of teeth some times cause disease also. These abscesses usually occur about the roots from which the nerves have been removed in the process of filling. They may also form as a result of exposure of the roots from pyorrhea with subsequent shrinking of the gums. They are usually painless and can only be detected by a thorough dental examination or by the x-ray.

Bodily Cleanliness

Fortunately among seamen as a whole bodily cleanliness is probably more common than among any other class of laboring men.

In the close association necessarily enforced on shipboard by the restricted quarters, a dirty man not only becomes conspicuous but is a health menace to himself and to others.

Frequent bathing of the whole body is a prime necessity in the maintenance of health. The perspiration and other secretions of the skin are poisons. They decompose causing foul odors and furthermore, if not removed, clog up the pores and result in local irritation and in various skin diseases.

It makes little difference except from the standpoint of comfort whether baths are taken in hot or cold water providing plenty of good soap is used. Hot baths remove dirt and skin secretions more readily than cold. If an individual en-

joys a cold bath and is accustomed to it, it will probably do him no harm. Many persons do not react properly after cold baths but remain pale and chilly. They should, if possible, avoid them.

The hands should always be carefully washed before eating, especially after handling dirty substances, articles which might carry the germs of disease or after going to the toilet. In this connection, each man should have his own towels and should see that others do not use them. It is not infrequent to see disease spread from one to another by the use of the common towel and on a number of occasions the writer has seen men develop gonorrhea of the eyes as a result of using either the common roller towel or a towel belonging to someone of his shipmates who had gonorrhea at the time.

In addition to frequent bathing of the hands, face and body, the hair and beard should be carefully washed and combed. Regardless of statements made to the contrary, frequent shampooing of the hair is not harmful.

On account of the possibility of the hair and beard becoming infested with vermin, it is better if they are worn clipped moderately short.

Both the finger and toe nails should be cut at regular intervals and the dirt always carefully removed from beneath the finger nails before eating as this dirt may contain the germs of disease.

Bathing Facilities

The installation of bathing facilities is simple, and each vessel should have a heated place fitted up for bathing. It is not necessary to install bath tubs or an elaborate bath arrangement. A small cubicle or cuddy, opening on the crews' quarters and having hot and cold-waterpipes run into it, with an arrangement for a shower bath, is certainly not too much to expect of steam vessels, and even on sailing vessels care should be taken to make some satisfactory arrangements in this important matter. The galley should be required at all

times to furnish sufficient hot water for bathing and the necessary vessels provided. A protected place on board ship should be specifically designated, where the crew may be made as comfortable as possible in the performance of this very necessary duty. The old system of bathing on a cold steel deck in icy salt water was not conducive to personal cleanliness. Fortunately, most of the newer steam vessels have been built with a warmed bath house.

Clean Clothes

The clothing, especially the undergarments and socks, should be changed frequently for they absorb much perspiration and skin secretion and quickly become offensive. Clean undergarments should be put on after the bath else half the benefit of bathing is lost. The washing of underclothes and socks consumes very little time and energy and is well worth the effort.

It is not an indication of a high degree of self-respect to see a man coming ashore wearing a well pressed suit and a silk shirt and underneath these have on dirty socks and underclothes.

In a later paragraph will be found directions for getting rid of vermin should the clothes become infested.

Bed and Bedding

At regular intervals all living quarters on board ship should be carefully cleaned under the supervision of one of the ship's officers. Blankets, mattresses and pillows should be taken on deck, thoroughly beaten and exposed to the sunlight as frequently as the weather will permit. (See directions in the following paragraph for getting rid of vermin.)

Getting Rid of Vermin

If one of the members of the crew is infested with lice, these may spread to all the occupants of the forecastle, unless im-

mediate steps are taken to prevent it. In the detection of lice the seams of the clothes, especially the underclothes, should be carefully examined since lice and nits will often be found in the seams of the clothes when none can be found on the body of the individual. The lousy individual should have his hair and beard cut short and the parts harboring the lice should be thoroughly washed in a mixture of coal oil and soft soap or gasoline and soft soap. A good delousing soap mixture consists of

Chip soap	1 part
Gasoline	4 parts
Water	3 parts

Mix together thoroughly and use as soft soap, especially on hairy parts of the body.

One of the most efficient methods of getting rid of crab lice is to shave all the hair from the infested part and follow this by a single thorough coating of blue (mercury) ointment which should remain at least 8 hours. To get rid of vermin in clothing, the garments should be treated by boiling, flowing steam, steam under pressure, soaking in gasoline (dry cleaning), or, if the clothes are not valuable, they should be burned or thrown overboard. Vermin may also be killed by fumigation with sulphur gas, though this is hard on woolens and colored things.

Thorough pressing with a hot iron will also kill lice and nits. In pressing clothes to rid them of vermin, special attention should be paid to the seams of the garments.

The same procedure somewhat modified should be carried out to rid beds and bedding of vermin.

Where the quarters, beds and bedding become infested with bed bugs, lice or roaches, fumigation is usually the simplest and most effective procedure for getting rid of them. If a ship is near a quarantine station, arrangement may be made to have the quarters fumigated by the quarantine crew. They may use poison gas for the fumigation but if it becomes

necessary for the ship's crew to do the work, fumigation with sulphur gas will prove more safe and quite as effective.

Many steamship lines have made arrangements to have all beds and bedding disinfected by steam under pressure at the end of each round trip but for "tramps" this procedure is not practicable. For methods of fumigation, see page 39.

In fumigating for vermin it may be necessary to repeat the fumigation in from five to seven days, since only the living vermin and a part of the eggs will be killed at the first fumigation and another treatment may be necessary in order to kill those vermin that hatch out later.

Clean Drinking Water

The necessity for good drinking water on shipboard is generally recognized and the water supply taken on in ports of the United States is usually pretty good. However, it occasionally happens that a ship takes on fresh water for drinking purposes, at an out of the way port, and it may be that at the same time she takes on cholera or typhoid germs, together with the fresh water. Unless the water supply is above suspicion, the water for drinking purposes should either be distilled, boiled, or disinfected by chemicals in the tanks before it is used. Infected or doubtful water can be made safe for drinking purposes by boiling for at least five minutes and then cooling.

Disinfection of Drinking Water by Calcium Hypochlorite

Disinfection of moderately clean water by chemicals is done quite readily by adding calcium hypochlorite (chloride of lime); also sometimes called bleaching powder, 15 grains (1 gram), to each barrel of water. Chloride of lime (calcium hypochlorite) should be carried as part of the medical supplies. This can be secured from almost any drug house in convenient form such as 15 grain (1 gram) tablets. One of these tablets, for each barrel of water, is crushed, made into

a paste in a tablespoonful of water and added to the water to be disinfected. After one-half hour, the water should be safe for drinking purposes. In this amount, it gives the water practically no taste and is absolutely harmless. If calcium hypochlorite tablets are not available, the water can be disinfected safely by using ordinary bleaching powder or chloride of lime, ¼ level teaspoonful to the barrel of water. If in doubt as to the safety of the water use more lime. Although the taste may be disagreeable if added in excess, this substance in reasonable quantities is harmless. The lime should be taken from a freshly opened can. This is used in the same way as in the case of the tablets. As chloride of lime (calcium hypochlorite) soon loses its strength it is recommended that the old stock be thrown out at the end of each six months and a fresh supply secured.

If chloride of lime is not available, drinking water may be disinfected by adding one *tablespoonful* of standard tincture iodine to one barrel of water (approximately 55 to 60 gallons), stirring and allowing it to stand for a half hour before using. The first method is better.

Stills

Practically all the new ships are equipped with stills for the preparation of pure water from sea water. Distilled water is the purest form of water and is always safe for drinking unless it has been stored in dirty containers. The use of distilled water is strongly advised where possible and practicable.

Filters

Manufacturers of commercial filters maintain that their filters will always produce a pure water fit for drinking purposes. This is not always true, as many of the commercial filters are not reliable and in fact may do positive harm, although if used only to clarify water, and the water is afterward treated with bleaching powder, the filter may serve a useful purpose.

Foods

There was a day, fortunately, now almost passed, when it was considered an economy to furnish for the use of the crew the poorest grade of food that could be bought. The rules laid down by the Department of Commerce (see appendix), for the rationing of American ships, if observed, will furnish a fairly well balanced and satisfactory ration, provided the quality is good. Of course, if the skipper or his steward become too economical in the matter of quality, in their buying, even with the present ration allowance, poor food may still obtain, but this condition is becoming more and more rare. Without ice or without an ice making plant, it is practically impossible to keep fresh meats more than three or four days and attempts to do so will only result in illness.

Scurvy

It is hardly necessary to bring up the subject of scurvy in the present day, but for the sake of the few who need this advice, scurvy is a disease caused by the eating of food usually salty or dried, for a considerable period of time, without the addition of fresh vegetables or meat. This disease is a deficiency disease and is really due to the lack of one of the vitamins, which is killed by salting and thoroughly drying the foods. Even on a long voyage the prevention of scurvy is comparatively simple if the Department of Commerce regulations (see appendix) are followed and fresh bottled lime or lemon juice is carried and dispensed to the crew at regular intervals and in given quantities. Tomatoes, either fresh or canned, are especially valuable in the prevention of this disease. Vinegar, sweetened with sugar, is also useful as a preventive and should be dispensed to the crew in the same way.

Method of Using Antiscorbutics

Not more than ten days after it is necessary to use largely salty food in feeding the crew, lime or lemon juice should be

served to each man, one-half ounce per day, and vinegar and sugar one-half pint per week. These substances must be used as long as it is necessary to feed the crew largely on salty foods. Any sort of fresh fruits or fresh vegetables will prevent scurvy. Tomatoes are especially rich in those substances which prevent scurvy and they remain present even in cooked and canned tomatoes. In the present day this disease usually is an indication of carelessness and neglect on the part of the owners and officers.

A word of warning might be added here regarding the danger of using fresh uncooked fruits and vegetables in the orient. The danger arises from the habit, which is nearly universal in the Far East, of using fresh human excrement as a fertilizer on growing fruits and vegetables, thus possibly infecting nearly all low growing fruits and vegetables with cholera and dysentery.

Ordinary washing will not remove all the infecting organisms. One of the best methods of rendering oriental fruits and vegetables fit for human consumption is to dip them in boiling water for at least one and a half minutes, then chill them on ice or in the cold room. This process does not affect the flavor or the value of the fruit or vegetable as an antiscorbutic.

Light and Ventilation

Fresh air and light are necessary for health. Ventilators should be so arranged that there is a constant flow of fresh air through all parts of the vessel, especially through the quarters. Proper ventilation, namely, a constant flow of pure air, will do much to prevent the spread of tuberculosis and other diseases aboard ship. Quarters should be sufficiently well heated that, even with a constant flow of fresh air, they will be comfortable. The same rules hold true aboard vessels of the merchant marine, as in the Navy, regarding the necessity for light and ventilation. The A-B-C of ships' sanitation in the Navy is sunlight, physical cleanliness and plenty

of air. Quarters should be well lighted and a great deal of attention paid to ordinary physical cleanliness. Unless daily inspection of quarters is made, it can hardly be expected that they will be kept in good order, but this should be just as much a part of the duty of the ship's officers as navigation, since the welfare of the crew is of great importance. It will hardly be necessary to take up the matter of ventilation in any detail since all seamen of the merchant marine are well acquainted with the use of ventilators, windsails, etc.

Exercise

A certain amount of physical exercise is necessary to maintain health. Most seamen, in the ordinary routine of their duties, get sufficient exercise. There are on every ship a certain number of individuals whose occupation keeps them at their desk or at some sedentary work a great part of their time. If they expect to remain healthy, they must take a certain amount of systematic exercise. There are many inexpensive pieces of gymnasium apparatus which they can carry with them and which will furnish them with an opportunity to exercise their muscles in spite of the restrictions of shipboard.

Then too athletics should be encouraged among officers and crew. Many ships have good baseball, basket-ball, and football teams and opportunity should be offered them to play against shore teams as often as possible.

The encouragement of athletics on a ship makes a more contented and a healthier crew who will spend less of their time in dissipation while in foreign ports if they have these events to look forward to and to occupy their spare time.

Moderation in Eating and Drinking

Moderation is to be enjoined in all things. It is just as easy to overeat as it is to fail to get enough to eat, especially for those of the ship's complement who are not actually em-

ployed at manual labor on board. Overeating and under-exercise do quite as much damage as under-eating and over-work.

Unless human nature changes markedly, there is little use in warning most seafaring men against over-indulgence in alcohol. Without a doubt, it is harmful, leads to certain disorders of the stomach, liver and kidneys and a spree ashore too often results in grave injuries and not infrequently the lock-up, to say nothing of the subsequent venereal disease which the man might have avoided if he had not been drunk. Drinking among sailors may gradually decrease. However, as long as seamen have no particular place to go and nothing to do when ashore except visit bars and brothels, a certain number will continue to over-indulge themselves. Welfare workers might well make a note of the fact that a large part of the responsibility of the sailors' misconduct ashore lies at their door.

Seafaring men are grown men with just about the average male's hopes, desires and habits. So long as they have no friends with whom to associate and no decent place to go just so long will they fall *into bad habits.*

Neither can they be intrigued by childish games and bed time stories. They demand a healthy companionship and men's amusements or they go their own way.

Inspection of Crew before Sailing

Just before putting to sea the crew should be mustered and inspected for illness. Any man who appears sick with severe cough, fever, diarrhœa, vomiting, chills or cramps should be sent to hospital or at least put ashore. A man with severe rheumatism, pain in the chest, inflamed eyes, painful ear or with acute venereal disease may become not only utterly useless within a few hours or a few days after leaving port, but he may also require one or two well men to care for him while sick. It is not fair either to the sick man or to the other

members of the crew to put to sea under such conditions. Just as the ship itself is overhauled for defects so the crew should be known to be "ablebodied" in every sense of the word before the ship weighs anchor or casts off a line. Men will be examined at any relief station of the Public Health Service free of charge to ascertain whether they are fit for the voyage. (See list of relief stations on page 175.)

PART II

CERTAIN DISEASES OF SPECIAL SANITARY SIGNIFICANCE ON SHIPBOARD

There are certain diseases which the individual may contract no matter how perfect his physical condition. They are known as "communicable" diseases. Against a few of them there are means of protection. Vaccination against smallpox, carefully and thoroughly done, practically does away with the danger of this disease. Inoculation against typhoid fever is highly successful, but against many others there is no certain protection known at present. It is advisable then not to come into contact with them and, if possible, to stay away from the places where such diseases are known to exist.

If it is necessary in the line of duty or in the care of the sick to come into immediate contact with persons suffering from communicable disease, the probability of contracting the disease can be lessened by observing carefully the directions given in the following paragraphs, with special care in regard to cleanliness, wearing clothing which can be sterilized afterward, and carefully washing the hands after touching the patient or articles which may possibly have become soiled by the discharges from his body.

The diseases of special significance from a sanitary standpoint are plague, yellow fever, typhus, malaria, smallpox, cholera, typhoid, tuberculosis and the venereal diseases. They are presented here only from the standpoint of prevention and sanitation. They will be taken up in greater detail in a later chapter.

Prevention of Plague

Bubonic plague is a disease transmitted by means of the bite of the flea which infests the rat. The flea becomes infected from feeding on a rat which has plague, and upon the death of the rat will attack man, and through its bite transmit plague. As all ships are more or less infested with rats, the control of plague depends on the control of the rat population. Every precaution should be taken to see that rats and mice do not get aboard ship, and every effort should be made to rid the ship of those already aboard. Rat guards, consisting of inverted cones or disks of metal, not less than three feet in diameter and so fixed as to be at right angles to the lines to which they are attached, should be placed on all lines leading to the dock when the boat is in harbor. (See Figure 1 for proper method of using rat guards.)

Articles that harbor, or are liable to harbor rats, should not be shipped until freed of such vermin. Special precautions should be taken to prevent rats from getting aboard when the cargo consists of grain or other food stuffs. All vessels engaged in trade with foreign ports must be fumigated not less than once in every six months for the purpose of destroying rats. Fumigation, done by the quarantine officer, is usually by means of cyanide, cyanogen chloride, carbon monoxide or sulphur gas. It might be necessary or advisable for the master of a vessel which had become infected to fumigate her himself, if at some out of the way port where fumigation with poison gas could not be done. In this case, the proper method would be by means of sulphur gas. (See methods of fumigation, page 39.)

If during the course of the voyage rats are found to be dying aboard ship the master should become suspicious of the possible presence of plague, as this disease usually kills many of the rats before any human cases develop. He should make a report of this occurrence to the nearest quarantine officer and if possible save the bodies of the rats for labora-

FIG. 1.—Proper method of placing rat guards on mooring lines.

tory examination at the quarantine. The rats may be preserved by dropping them into a receptacle containing enough 5 per cent carbolic acid or 10 per cent formalin solution to cover them. Of course, it is assumed that should plague break out on a vessel, she will immediately make for the nearest quarantine station where she can be fumigated, and where proper medical treatment can be given.

Prevention of Yellow Fever

Yellow fever is a disease common to certain warm climates, more especially parts of Mexico, Central and South America. It is caused by the bite of a certain kind of mosquito called the Stegomyia, which has fed on some person sick with yellow fever. The disease is more common to cities and ports than to country districts as the mosquito which transmits it is domestic in its habits and usually breeds in water barrels, jars, etc., about human habitations rather than in swamps, ponds and streams.

Where yellow fever is known to prevail, it is often advantageous to anchor at least 200 yards from the shore and fumigate, to rid the ship of mosquitoes, since the type of mosquito which carries this disease usually will not fly that distance and reinfest the ship. (See methods of fumigation, page 39.) Under all circumstances, careful screening of cabins and quarters should be carried out on any ship running to the tropics.

It is also advisable, especially at ports where there is known to be yellow fever, to take precautions to prevent mosquitoes from breeding in water tanks, buckets and other collections of standing fresh water about the vessel. To prevent access of mosquitoes, all water containers should be carefully screened with a fine mesh mosquito screen. In case some one on the vessel develops yellow fever, he should be very carefully screened to prevent the access of mosquitoes, as the disease can be spread only through the bite of this insect.

Prevention of Typhus

Typhus fever, also known as ship fever and prison fever, is a disease similar in many ways to typhoid but is carried from person to person by the bite of the louse. The louse having fed on some one sick of the disease becomes infected and may transmit the disease by biting some one else. For this reason every preaution must be taken to free both passengers and crew of lice. (See method of getting rid of vermin, page 7.) On account of the danger of typhus from certain parts of Europe, the U. S. Quarantine authorities delouse all persons entering the United States from infected places. In case typhus should break out on board, in addition to delousing the passengers and crew all baggage (dunnage) should be fumigated and the quarters also fumigated to kill lice and other vermin.

Prevention of Malaria

Malaria is transmitted in the same way as yellow fever, but by the bite of a different kind of mosquito, the Anopheles, which is essentially a country mosquito, and which usually breeds in pools, ditches, swamps, lakes, etc. The disease is quite common throughout nearly all tropical and sub-tropical countries, especially where there is a fairly heavy rainfall. The same precautions taken in killing yellow fever mosquitoes, will rid the ship of malarial mosquitoes. Malaria, however, usually follows shore leave, during which time the person is bitten by a mosquito carrying the disease. While in a port or locality where malaria is known to be common, each person should take from six to ten grains of quinine sulphate each day. If this is done regularly, it will prevent the development of this disease. The quinine may be taken in one dose or in smaller doses two or three times a day. The essential thing is to have a small amount of quinine in the blood at all times when in a locality where this disease is known to exist.

Prevention of Smallpox

Smallpox is a very acute and very contagious disease which spreads by direct contact from person to person. It is a disease which can be absolutely prevented, however, by vaccination. As all men going to sea are likely to be exposed to smallpox in foreign ports, periodic vaccination is advisable. Vaccination will give protection against smallpox usually for only a limited period of time. A second or third successful vaccination will prolong this period. As it is a harmless procedure, and when a person is protected no "take" occurs, it would seem advisable that seamen be re-vaccinated frequently. Any individual applying to a station of the U. S. Public Health Service will be vaccinated free of charge.

If an outbreak of smallpox occurs aboard a vessel, the patient should be immediately isolated from the rest of the crew and every one on board ship promptly vaccinated.

Method of Vaccination

A brief description of the proper method of vaccination is given here, in order that ship's officers may vaccinate members of the crew if no medical assistance is available.

Smallpox vaccine is usually put up in small glass tubes with directions for its use accompanying it. Vaccine spoils quickly, especially if not kept at a low temperature, and under any circumstance loses its potency if more than a few weeks old. It should be kept on ice or in the cold room at all times, and at the end of each trip, if the trip has been of more than one month's duration, all the old vaccine should be discarded and a fresh supply secured.

Vaccination is usually done over the outer side of the upper arm about four or five inches below the point of the shoulder. The skin over this part of the arm is first cleansed carefully either with a piece of gauze or cotton wet with alcohol or by scrubbing with soap and water.

The point of a clean needle is sterilized either by passing it through a flame or the needle is carefully boiled. Using the point of this sterile needle, two parallel lines about ½ inch apart and each about ½ inch long are scratched in that part of the skin of the arm previously cleansed.

These scratches should not be deep enough to draw blood but should be deep enough to cause a little serum (moisture) to ooze from them. Next, a small drop of vaccine is forced from the tube into each scratch. It is advisable to use the point of the sterile needle with which the scratches were made to spread the vaccine along the line of the scratch.

The vaccine should be allowed to dry on the arm for at least five minutes before the sleeve is put down. No other treatment is necessary. *Do not use a bandage or dressing over this freshly vaccinated area.*

If there is a "take," about five days after the vaccination, the skin over the vaccinated area becomes red and there is usually a little local swelling. This swelling increases until finally a blister filled with a cloudy fluid forms along the line of each scratch. The fluid in these blisters later turns to pus. At this time, there is often some swelling of the glands in the arm pit and the arm sometimes becomes quite sore for a few days. Eventually, the pus in the vaccination dries and a scab forms which falls off in about three weeks, leaving the typical vaccination scar.

Prevention of Cholera

Asiatic cholera occurs at times on shipboard. Cholera is present in certain ports and parts of the world at nearly all times. The disease is usually transmitted by swallowing the germs of cholera, either in food or water. Where the ship's water supply is taken from rivers or other sources which may contain cholera germs and the water is not disinfected, there is always a chance of members of the crew developing cholera. In the same way, vegetables or fresh fruits, washed in water containing cholera germs, may give rise to the dis-

ease, as may also the handling of food in its preparation by cholera carriers (those who have had cholera, recovered, but continue to discharge cholera germs in their urine or stool). Consequently, it is necessary to sterilize or disinfect all water which may possibly be infected with cholera. Fresh-water supplies, taken from rivers or wells, in ports where this disease is present, should be boiled or disinfected by means of chemicals before being used, and the food taken on at these ports, especially green vegetables and fruits, should be cooked before being eaten.

A method of vaccination against cholera has been developed which, when properly carried out, certainly helps to prevent the disease. The effects of cholera vaccination last for only about one year so that it is necessary to be re-vaccinated against the disease yearly. The use of the vaccine is advised in those visiting cholera ports.

Prevention of Typhoid

Typhoid is a disease transmitted in the same way as cholera, but is more common in cooler climates than in the warmer zones where cholera is usually found. The presence of either of these diseases is an indication of filth, and means that the urine or stool of someone having the disease has come in contact with the food or drink of the individual developing the disease. The same precautions in the matter of food and drink that are to be taken in the case of cholera, will serve to do away with the danger of typhoid.

Within recent years, there has been developed a method of vaccination against typhoid. This method gave excellent results during the World War. Any individual applying to a station of the U. S. Public Health Service will be vaccinated against typhoid fever free of charge.

Prevention of Tuberculosis (Consumption)

Tuberculosis is an infectious disease chiefly affecting the lungs. Seamen seem to be especially liable to develop it, prob-

ably because they are so closely housed in the restricted limits of shipboard, often without proper ventilation.

The disease is spread from person to person by means of tuberculosis germs which are coughed up. The droplets of sputum which fly through the air during a coughing spell and the matter coughed up from the lungs of a tuberculous person may contain thousands of the germs of this disease. If they are breathed into the lungs of a healthy individual, he in turn is liable to develop tuberculosis.

The prevention of the disease depends on the isolation of all persons suffering from tuberculosis or, since this is not possible, by having them cough into a kerchief and spit only into containers that can be burned or sterilized, and not where the sputum is liable to dry and be blown about to be breathed in by others.

In addition, the disease develops more often in those who overwork, lose too much sleep, dissipate and are underfed. The well fed, warmly clad man who gets sufficient sleep and who insists on plenty of fresh air seldom develops tuberculosis.

Known tuberculous individuals or those suspected of having this disease should not be signed on. If a tuberculous individual is found among the crew he should be required to rigidly carry out the precautions outlined above for the disposal of his sputum.

The above remarks apply of course only to active cases of tuberculosis. Persons who have recovered from this disease or persons in whom the disease is arrested, are not at all dangerous to their associates.

Prevention of Venereal Diseases

There are three common types of venereal disease. These are gonorrhea, syphilis and chancroid. These diseases are nearly always contracted through sexual intercourse The only certain method of prevention is to stay away from the prostitutes and loose women, who are to be found in every

port. It is recognized, however, that all the good advice that can be given will not always prevent seamen, coming ashore after a long voyage, from indulging themselves sexually. After all, the problem of the prevention of venereal disease comes down to a problem of cleanliness.

In order to prevent venereal diseases, *immediately following intercourse,* the parts should be *thoroughly* washed in soap and warm water. Thorough washing is most important as this measure in itself will, if carefully done, prevent the development of a considerable number of cases of venereal disease.

After a thorough washing, as prophylaxis against gonorrhea, the man, using a urethral syringe, should inject into his urethra about ½ syringe full (one and a half to two teaspoonfuls) of a 20 per cent watery solution of argyrol or the same amount of a 1 per cent solution of protargol or still better an equal amount of a 1 per cent solution of Mercurochrome. This solution should be held in the penis for at least one minute (a longer period is desirable).

After the injection is finished, a coating of 30 per cent calomel ointment should be applied to the penis and scrotum and rubbed in thoroughly for at least five minutes. This will prevent the development of syphilis. In place of using 30 per cent calomel ointment, the contents of one of the collapsible sanitary tubes on the market may be used in the same way. These tubes, when put up by reliable firms, are quite satisfactory. In any event the ointment is not to be washed off for several hours.

The success of these measures depends on the promptness and thoroughness with which they are carried out. The sooner after intercourse the prophylaxis is taken, the less likelihood of the development of venereal disease. If carefully done within an hour these measures offer very marked protection; if delayed for eight, ten or twelve hours they offer considerably less, although they should be carried out even after the lapse of a considerably longer period.

Likewise, they should be carried out with great thoroughness. Use plenty of soap and water, be sure and hold the injection long enough. Use plenty of the calomel ointment, making sure that no part of the skin which was exposed escapes the application, and that the ointment is rubbed in thoroughly.

Gonorrhea or "Clap"

Gonorrhea or "clap" is a disease consisting of a discharge of pus from the water passage, together with certain complications. The danger to others on shipboard is that of having some of this discharge get on the roller towels or sweat rags and so in this way get into the eyes of persons using these towels or sweat rags. The germs which cause gonorrhea will grow in the eye and cause a very severe inflammation, with swelling of the lids, a discharge of pus, and unless promptly treated, blindness. The prevention of this condition consists in having facilities where the crew may wash their hands after soiling with this discharge.

Syphilis

Syphilis, sometimes called "hard chancre," is a venereal disease which consists in the early or first stage of a simple ulcer or sore, more or less hard, which may be located anywhere, but usually appears on the genital organs. During the first and second stage, the disease is most dangerous to others. During the second stage, there is a breaking out on the skin and mucous membranes, especially in the mouth. Any person having this syphilitic sore mouth, using knives, forks, cups, or other eating or drinking utensils, may infect the utensil, and another using the utensil after him is liable to develop the disease. In this case, they in turn may develop a primary sore or the first stage of the disease, on the lip, tongue or tonsil. Any member of the crew having a breaking out on his body, together with a sore mouth should be care-

fully watched to see that he uses only his own eating utensils, towel, etc., and keeps them separate from those of others.

As a word of warning, men who have had syphilis should not consider themselves cured merely because they have no further breaking out on their bodies or in their mouths. Syphilis is a long drawn out, chronic disease, which requires anywhere from one to three years of treatment to cure, and even then this cure is not certain, and it will be necessary for the man to report to a physician at least once a year for the next several years in order that he may have his blood tested and take further treatment if necessary.

PART III

MARITIME QUARANTINE

Quarantine rules and regulations are familiar to most seafaring men, especially officers, so that a mere outline of them will be given in this manual, together with the reasons for them.

Quarantine is maintained at all ports of entry, both in this country and others, against ships coming to the country from a foreign port. This quarantine is maintained by Government officials for the purpose of keeping out of the country diseases which may be brought by those aboard ship or by animals or insects carried on the ship, from the ports of clearance or of call, to the port of entry.

Quarantinable Diseases

In the United States, quarantine is maintained against plague, smallpox, leprosy, yellow fever, typhus, cholera and anthrax. While the quarantine regulations differ somewhat in different countries, they are similar in nature and purpose —exclusion of the most dangerous contagious diseases.

Bills of Health

Among the clearance papers necessary for a vessel bound from a foreign port to a port of the United States is the "Consular Bill of Health" which shows the prevalence and varieties of diseases occurring in the ports of clearance. If this bill of health shows unusual prevalence of any quarantinable disease, special care is taken at the port of entry to see that none of these diseases is brought into the country by passengers or crew, and if the disease may be carried by an insect or animal the ship is quarantined and fumigated to rid her of the insect or animal carrier of the disease.

Under the quarantine regulations of the United States it is required that a vessel obtain a bill of health from her port of departure and a bill of health from each port of call. The form of the bill of health, as prescribed by regulation, is given below. These bills of health are very important papers and convey information which may determine the quarantine status of a vessel upon her arrival at a port of entry in the United States.

UNITED STATES OF AMERICA

Bill of Health

I, ...(the person authorized to issue the bill, at the port of.....) do hereby state that the vessel hereinafter named clears (or leaves) from the port of.....under the following circumstances:
Name of vessel.....
Nationality .....Master .....
Tonnage, gross .....Net.....
Name of Medical Officer.....Number of Officers.....
Of crew, including Petty Officers.....
Officers' families.....Passengers destined for the United States.....First cabin.....Second cabin
Steerage.....Ports visited within preceding four months .....
.....
Location of vessel while in port: Wharf.....
Open bay.....Distance from shore.....
If any passenger or member of crew disembarked on account of sickness, state disease.....
Time vessel was in port.....
Character of communication with shore.....
Sanitary condition of vessel.....
Sanitary measures, if any, adopted while in port.....
.....
Sanitary condition of port and vicinity.....
Prevailing diseases at port and vicinity.....
Number of cases and deaths from the following named diseases during the past two weeks ending.....
.....

Diseases	Number of Cases	Number of Deaths *	REMARKS (Any conditions affecting the public health existing in the port of departure or vicinity to be here stated)
Yellow fever ...	.....	.....	
Asiatic Cholera..	.....	.....	
Cholera Nostras or Cholerina ..	.....	.....	
Smallpox	.....	.....	
Typhus Fever ...	.....	.....	
Plague	.....	.....	
Leprosy	.....	.....	

* When there are no cases or deaths, entry to that effect must be made.

Date of last case (within preceding year).

Cholera .....
Yellow fever .....
Human plague .....
Typhus .....
Rodent plague .....

I certify that the vessel has complied with the Quarantine Rules and Regulations made under the act of February 15, 1893, and that the vessel leaves this port bound for..... United States of America, via.....

Given under my hand and seal this.....day of.....19....

(Signature of Consular Officer).....

.....

(Seal)

Countersigned by:

.....

ABSTRACTS OF QUARANTINE LAWS AND REGULATIONS OF THE UNITED STATES

Some knowledge of the quarantine laws and regulations of the United States is of very essential importance to the Masters of all vessels. Brief abstracts of the more important features of these laws and regulations are given here.

The bill of health will not be issued until the officer issuing the bill of health has satisfied himself that the vessel, passengers, crew and cargo have complied with all the quarantine laws and regulations of the United States.

Vessels before storing cargo or receiving passengers should be mechanically cleaned in all parts, especially the hold, forecastle, and steerage, and loose dunnage in unladened compartments shall be so arranged as to prevent the harborage of rats.

All articles suspected of being infected shall be disinfected before shipment. No person suffering from any communicable disease or any acute infectious disease should be allowed to board the ship.

General Regulations at Sea

The master of a vessel should observe the following measures on board his vessel:

The water closets, forecastle, bilges, and similar portions of the vessel liable to harbor infection should be frequently cleansed and disinfected.

Free ventilation and rigorous cleanliness should be maintained in all portions of the ship during the voyage and measures taken to destroy rats, mice, fleas, flies, lice, mosquitoes and all vermin.

A patient sick of a communicable disease should be isolated and one member of the crew detailed for his care and comfort, who, if practicable, should be immune from the disease.

There should be as little communication as possible between the patient or his nurse and other persons aboard the ship.

Clothing, body linen and bedding of the patient should be immersed at once in boiling water or in a disinfecting solution.

After the removal of a patient from a compartment, this compartment should be thoroughly cleaned and disinfected.

Any person suffering from malaria or yellow fever should be kept under mosquito bars and the compartment in which he is confined closely screened with mosquito netting. All mosquitos on board should be destroyed by fumigation. Mosquito larvæ (wigglers or wiggle tails), should be destroyed in water barrels, casks and other water collections aboard the vessel, by the use of petroleum, or where this not practicable, the receptacle should be covered by a mosquito netting to prevent the exit of the mosquitos from such breeding places.

In case of bubonic plague, special measures must be taken to destroy rats, mice and other vermin aboard the ship. In case of pneumonic plague, the patient should be isolated, the body discharges disinfected, especially the sputum, and the attendant on the case should wear a mask of gauze.

In case of typhus, special measures should be taken to destroy lice.

In the case of cholera, typhoid fever, or dysentery, the drinking water should be boiled and all foods thoroughly cooked. The discharges from the patient should be immediately disinfected and then thrown overboard.

If there is a ship's physician on board, an inspection of the vessel including the steerage should be made once each day.

Should any communicable disease appear on board ship while at sea, those who show symptoms of any of these diseases should be isolated and the Captain should note the illness in his log and all effects liable to convey the disease should be destroyed or disinfected. In the case of smallpox, every one aboard the ship at the time should be vaccinated.

The hospital should be cleaned as soon as it becomes vacant.

The dead, except those dead of yellow fever, should be wrapped in a sheet saturated with one of the strong disinfecting solutions and without previous washing of the body at once buried at sea or placed in a coffin hermetically sealed.

A complete clinical record shall be kept by the ship's surgeon of all cases of sickness on board and the record delivered to the quarantine officer at the port on arrival.

The following disinfecting solutions are recommended for use at sea:

Formulae for Strong Disinfecting Solutions.

Bichloride of Mercury (1:500)

	Parts
Bichloride of mercury	1
Sea water	500

Mix

Carbolic Acid (5 per cent.)

Alcohol	50
Carbolic acid, pure	50

Mix

Then add fresh water	900

Formulae for Weak Solutions

Bichloride of Mercury (1:1000)

Bichloride of mercury	1
Sea water	1000

Carbolic Acid (2½ per cent.)

Carbolic acid, pure	25
Fresh water	1000

Formalin (5 per cent.)

Formalin (or formal)	50
Water	950

It is suggested that a vessel should carry for every 100 passengers: Bichloride of mercury, 5 pounds; carbolic acid, 10 pounds; alcohol, 10 pounds; formalin, 10 pounds; 100 pounds of sulphur and 12 Dutch ovens, about 12 inches diameter, and an adequate supply of fresh vaccine virus.

Inspection of Vessel

Every vessel subject to quarantine inspection entering a port of the United States should be considered in quarantine until given free pratique, and such vessel shall fly a yellow flag at the fore-

mast head and shall observe all the other regulations of vessels actually quarantined.

No person, except the quarantine officer, his employees or pilot, shall be permitted to board any vessel, subject to quarantine inspection until the vessel has been inspected by the quarantine officer and granted pratique.

Special Measures Against Cholera at Foreign and Insular Ports

At ports where cholera prevails, special care should be taken to prevent the water and food supply from becoming infected. All drinking water, unless of known purity, shall be boiled and the foods thoroughly cooked and protected against flies, etc.

Water closets and toilets of vessels, including their discharge pipes, must be kept mechanically clean.

Certain foods which are usually consumed uncooked and which come from localities in which there is cholera or through such localities, should not be shipped. This is especially true of vegetables which are ordinarily eaten in the uncooked state.

Steerage passengers coming from cholera infected districts should be detained for five days in a place known to be free from any source of infection.

If cholera appears on board during the voyage, fruits and vegetables that are ordinarily eaten in the uncooked state shall either be destroyed or rendered harmless by cooking.

The water supply of the vessel shall be sterilized either by boiling or by chemicals.

The discharges of a patient and all those in immediate contact with him, shall be carefully disinfected before being disposed of.

Any part of the ship which has been soiled by the discharges from a cholera case shall be washed down with a strong solution of bichloride or carbolic acid.

Yellow Fever

Six days is considered the incubation period of yellow fever. At any port where yellow fever is known to exist, special precautions should be taken to prevent the introduction of mosquitoes (Stegomyia) on board the vessel. Water tanks, water buckets and other

collections of water shall be guarded in such a way that they shall not become a breeding place for mosquitoes. Where the vessel has lain close to the shore, measures should be taken to destroy all mosquitoes which have come aboard.

Anyone sick of yellow fever shall be carefully protected by netting against mosquitoes. The ship shall be moored, if possible, at least 200 yards from the inhabited shores, since the mosquitoes will usually not fly that far. The ship should be fumigated for the destruction of mosquitoes. For the destruction of mosquitoes, there shall be a complete fumigation of all parts of the vessel at the same time by sulphur dioxide gas or by cyanide gas.

Plague

At ports or places where plague is suspected, every precaution shall be taken to prevent rats and mice from getting aboard the ship. Vessels sailing from such ports shall be fumigated in all parts for the destruction of rats if the vessel lies at a dock. All connecting lines must be guarded by inverted cones or disks not less than three feet in diameter and so fixed as to be always at right angles to the line to which they are attached.

A plague infected ship should be fumigated in all parts at the same time for the destruction of rats, including those that may be in articles of cargo.

Smallpox

For quarantine purposes, fourteen days is considered the incubation period for smallpox. All passengers and crew coming from smallpox districts or who have been exposed to smallpox should be vaccinated unless they can show satisfactory evidence of having had smallpox or a successful vaccination within one year.

Typhus

For quarantine purposes, 12 days shall be considered the incubation period for typhus. Clothing, personal effects and baggage of those having typhus and those exposed to typhus shall be fumigated for the destruction of vermin (lice). All persons found to be vermin (louse) infested shall be treated for the destruction of lice.

Leprosy

No alien leper should be permitted to embark from a foreign port for a port in the United States either as a passenger or as a member of the crew. No alien leper shall be permitted to land.

DISINFECTION AND DISINFESTATION

When an object is contaminated with the germs of disease (by contaminated we mean that the object has germs either in or on it), that object is said to be *infected.* If a bottle of water contains cholera germs, it is said to be infected with cholera. In the same way, a room which has been used for a patient ill with typhoid is said to be infected, since examination may show that the floors, walls and furniture of the room are contaminated with the germs of the disease. The term "infected" applies chiefly to objects which are contaminated by *germs.*

When the object has in or on it, not germs, but some of the higher forms of life, such as; lice, bed bugs, flies, mosquitoes, rats, mice, etc., we say that the object is *"infested"* (For convenience, we group all the above insects and animals into one class and call them "vermin.")

If a ship has rats aboard, it is said to be "infested with rats," in the same way a room in which there are bed bugs is said to be infested with them.

Disinfection is the process of destroying or removing the germs of disease with which an object is infected. *Disinfestation* is the process of destroying or removing the vermin with which an object is infested.

At times in disinfecting we may also accomplish disinfestation and vice versa but usually the processes are different and it is well to bear the difference between these two terms in mind.

Usually disinfection is more limited in its scope than disinfestation.

Not all parts of a vessel may need disinfection, but only those parts which have become infected by the presence of some person or animal sick with a disease due to germs. Prompt disinfection of a very small part of a vessel may prevent the spread of infection aboard ship and later, obviate serious quarantine delays.

There are a large number of agents which may be used in the process of disinfection. These include physical agents, such as; sunlight and heat, various chemical agents in solution which are used in liquid form, and also certain gaseous agents. When a gaseous agent is made use of, the process is called *fumigation*. Fumigation is used both in disinfection and disinfestation. The subject of disinfestation will be taken up a little later.

Methods of Disinfection

Any article which is burned is, of course, disinfected. This may be the method of choice in disinfecting cloths, rags, clothing and bedding of little, if any value.

An article immersed in boiling water for a few minutes is effectually disinfected. Likewise, exposure to flowing steam or, better still, to steam under pressure, will disinfect infected objects.

Where the apparatus is available, disinfection by steam under pressure is a very valuable and certain method. It is especially useful in disinfecting clothing, bedding, mattresses and baggage. Articles exposed to steam at 20 lbs. pressure for 10 to 15 minutes are effectually disinfected. In order to produce thorough disinfection by flowing steam, articles must be exposed for at least 30 minutes. Exposure to dry heat, if continued for a long enough period, will also disinfect. Exposure to direct sunlight will kill some disease germs but should not be depended on too much as it alone will not kill all disease germs. As an adjunct to other methods of disinfection, it is highly valuable.

Such agents as bichloride of mercury, carbolic acid, and

cresol, in proper solution and properly applied, will serve admirably to disinfect floors, walls, bunks, and similar places. In disinfecting a room, for example, these agents may be made use of effectively. They are easy of application and can be relied upon. Also bedding, clothing, and similar articles may be immersed in such solutions for an hour or more, with the assurance that they will be disinfected.

Disinfection may also be accomplished by the use of gaseous agents. This process is called *fumigation*. Many of the fumigating agents commonly used have little or no disinfectant action but are used purely as disinfesting agents. Certain of the gases used, however, in fumigating have powerful disinfectant action.

One of the most useful fumigants is sulphur dioxide produced by burning sulphur. In the presence of plenty of moisture, this gas really has a powerful disinfectant action and is quite safe for any one of ordinary intelligence to use.

The method of carrying out sulphur fumigation will be described later.

Disinfection After Infectious Diseases

The process of disinfection is of use chiefly about the sick room and in preparing a room and its contents for use after acute infectious disease. The first step in making a room safe for use after it has been occupied by some one ill with an acute infectious disease is, if possible, a thorough fumigation with sulphur.

After fumigation, the walls, bunks, floors, etc., should be thoroughly washed either with a 5 per cent carbolic acid solution, a 1:1000 bichloride of mercury solution, or with a 2 per cent solution of cresol. If the above disinfecting agents are not available, a room which has been occupied by a case of smallpox, typhoid, or cholera, can be made safe for use by thoroughly scrubbing decks, walls, ceilings, bunks, etc., first with plenty of soap and hot water, followed by large

quantities of freshly opened chloride of lime, using a pound can of chloride of lime to each two buckets of water. All bedding, tableware, etc., used by the patient, or having come in contact with him, should either be boiled, burned, disinfected by flowing steam, or by steam under pressure. Under no circumstance should they be used by any other person until treated to kill the germs. If boiling or burning are not practical, the bedding, etc., may be immersed in a 2 per cent solution of cresol for at least an hour. Incidentally during the course of the illness, all discharges from the patient should be disinfected by the addition of an equal part of 5 per cent carbolic solution and should stand for one hour before being thrown overboard.

Fumigation

The process of fumigation is carried out either with the idea of disinfection after infectious disease, or it is done to destroy vermin, such as lice, bed bugs, flies, mosquitoes, rats, etc.

Many of the gases used as a routine in quarantine fumigation have little or no disinfectant action but are used chiefly as disinfesting agents. Among the substances used in fumigation are cyanide, cyanogen chloride, carbon monoxide, sulphur gas and formaldehyde.

The first three of these—cyanide, cyanogen chloride and carbon monoxide—are exceedingly poisonous and fumigation with them should be done only at quarantine by experienced fumigators equipped with the necessary apparatus to safeguard them while doing the work. These three gases are used only as disinfestants. Single compartments or the whole ship may be simultaneously fumigated with any of them for the destruction of vermin.

Formaldehyde gas is not used to any great extent as a fumigant, its application being limited usually to a single room or compartment as a disinfectant after infectious disease. The disinfectant action of this gas is not as certain as that of sulphur dioxide.

Sulphur gas combines the properties of a disinfectant and disinfestant. It is effective and safe, and in inexperienced hands, is certainly the fumigating agent of choice.

Sulphur Fumigation

Sulphur dioxide gas produced by burning sulphur is an effective disinfectant providing there is plenty of moisture present with the gas.

In using sulphur for disinfection, it will be necessary to vaporize about one pint of water for each 5 lbs. of sulphur burned.

If the gas is used merely for killing vermin, the vaporization of water is not so essential.

The only things required for sulphur fumigation are sulphur, containers for the sulphur and alcohol to ignite it. It is also well to have plenty of paper and a quantity of flour paste, in order to effectually seal up cracks, key holes, etc., through which the gas might escape. All ventilators, ports and other openings in the compartment to be fumigated should be carefully closed. The smaller openings, key holes, cracks, etc., should be pasted shut with strips of paper in order to prevent the escape of the gas. In order to promote full combustion, it is better to break the sulphur into small pieces.

The sulphur may be burned in any sort of metal containers, providing they are heavy enough not to melt or to burn through from the heat generated. If possible, broad shallow iron pots should be used as containers though if these are not available, metal buckets or pans may be used. Under no circumstance should more than 30 lbs. of sulphur be placed in any one pot, since if a larger quantity is placed in one container combustion will not be complete.

Great care must be taken to avoid fire.

PART IV

ANATOMY AND PHYSIOLOGY

The Skeleton

The framework of the human body is called the bony skeleton. The individual bones of this framework are joined together by means of bands called ligaments which act in much the same way as the straps of a hinge.

The bones are covered by a pad of muscles which are attached to the bones by means of leaders or tendons. When these muscles shorten, they move the bones and consequently, the whole frame. The muscles are covered by a layer of fat and over this the skin. There are about 200 bones in the body, divided roughly into long bones, irregular bones and flat bones. For example of each, see Figure 2.

The bones of the body are all named, but with the exception of a comparatively few, are of very little interest in first aid work. The principal bones and their relation are shown in the accompanying illustration, which is that of a complete skeleton with the principal bones indicated. See Figure 3.

Muscles

The individual muscles are of very little interest, as they do not work separately but in groups, each group having a certain function to perform. The accompanying illustration, Figure 4, shows the grouping and arrangement of the muscles of the body.

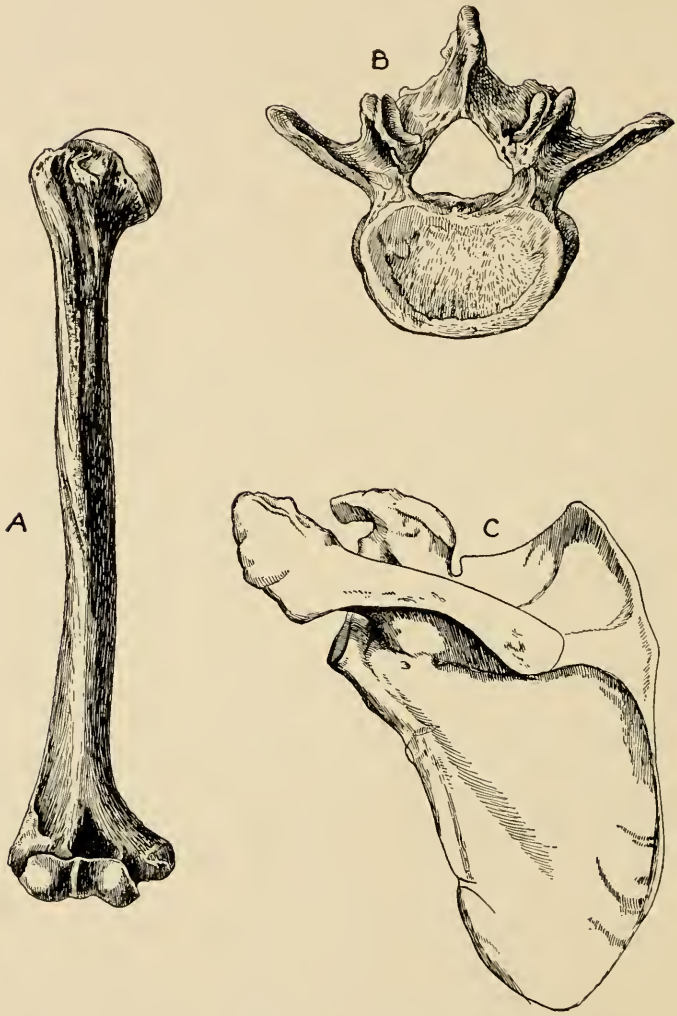


FIG. 2.—Long bone (humerus) A. Irregular bone (vertebra) B. Flat bone (scapula) C.

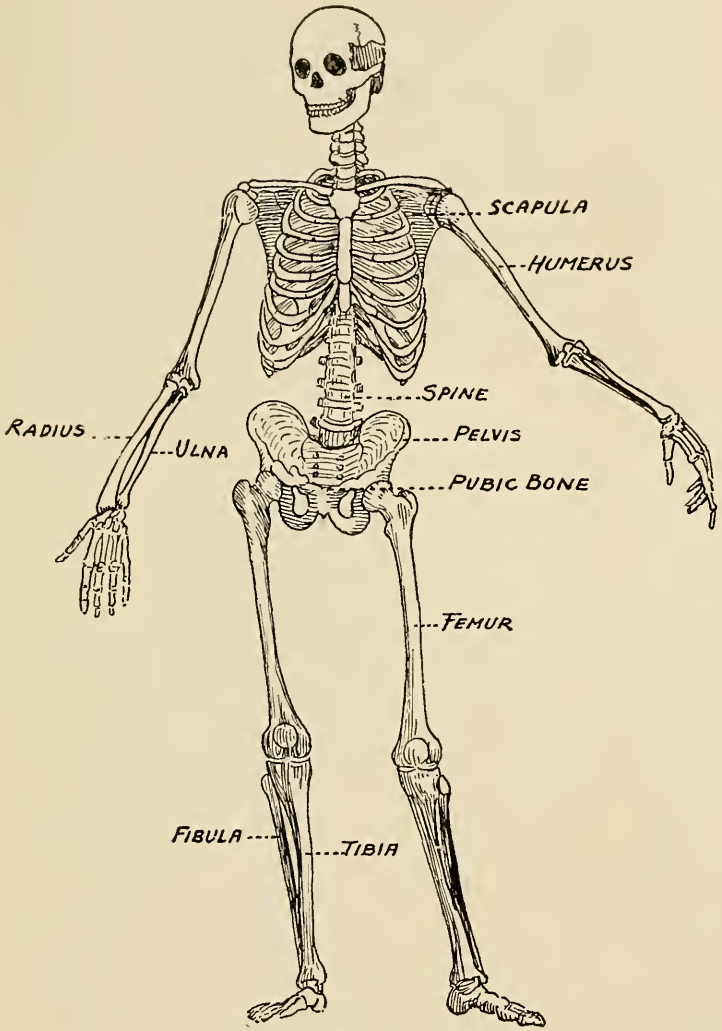


FIG. 3.—Human skeleton.

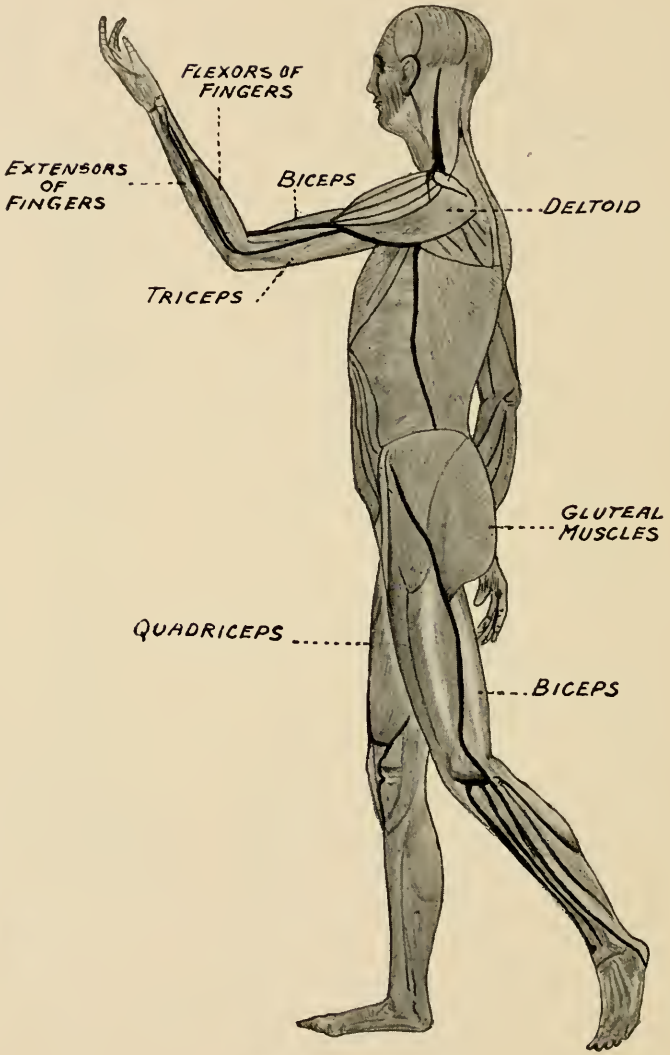


FIG. 4.—Muscles and muscle groups.

Arteries

The muscles, bones, fat, etc., are supplied with blood from vessels called arteries which run from the heart to the various parts of the body. Figure 5 shows the course and distribution of the more important of these vessels.

Veins

The veins are the vessels which carry blood from the various parts of the body to the heart. These veins are thin walled vessels which carry blood at very low pressure. Figure 6 shows the course and distribution of the more important of these vessels.

Circulation of the Blood

The general scheme of the circulation is shown by combining Figures 5 and 6. These illustrations show the heart as the center of the system located inside of the chest. Leading off from it is the aorta, or great vessel of the chest, which branches in the upper part of the chest to supply the head and arms, the main trunk continuing down the middle of the body to supply the abdomen and legs. The upper branches again divide so that they supply the upper extremities (arms) and the head and neck. The lower branch subdivides into numerous vessels which supply everything below the level of the heart. The great arteries are accompanied by corresponding veins which follow very much the same course, but in which the flow of blood is in the opposite direction; namely, toward the heart.

Through this system, the blood flows outward from the heart, through the arteries, and back through the veins, thus reaching all parts of the body.

Difference in Arteries and Veins

You will have noted that at times blood, coming from a cut vessel will spurt, while at other times it flows out slowly

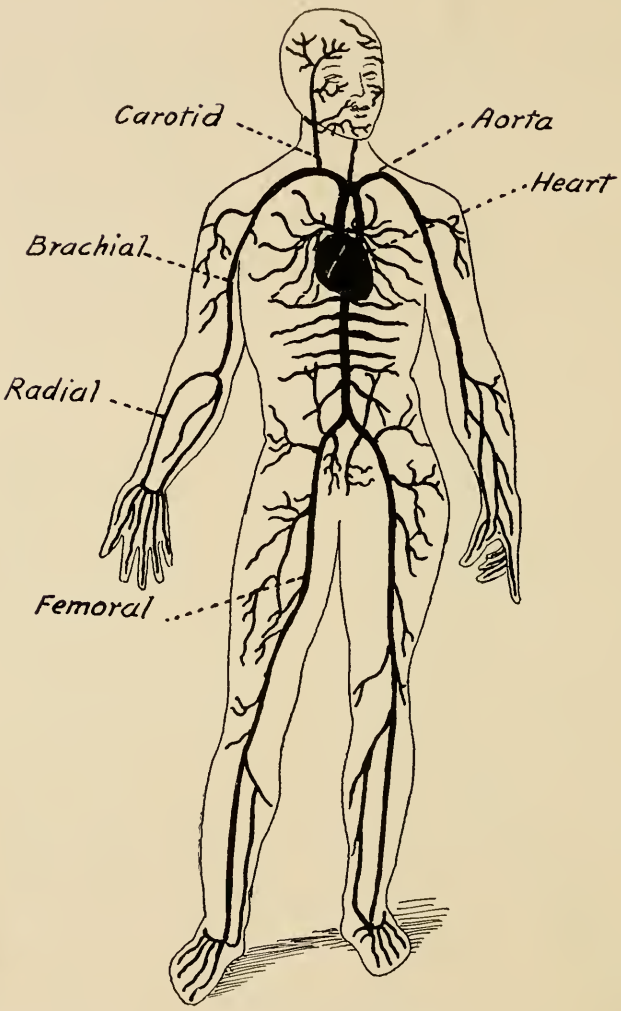


FIG. 5.—Arteries.

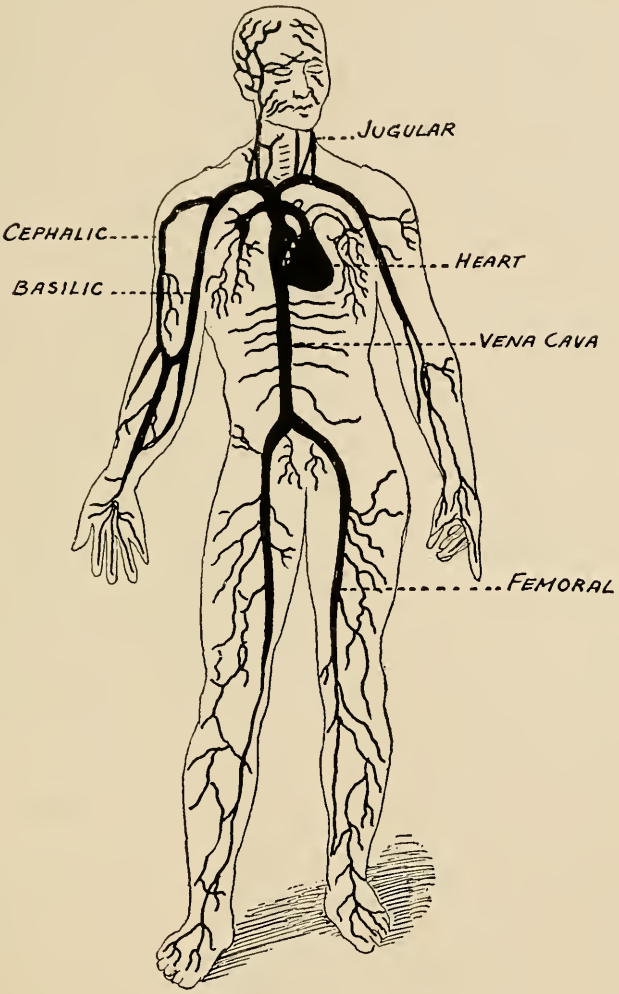


FIG. 6.—Veins.

and in a steady stream. This spurting blood comes from the arteries and is due to the action of the heart muscles which contract and force the blood from the arteries just as an ordinary pump would do. On the other hand, the blood flowing back to the heart through the veins flows at a very low pressure and does not spurt when a vein is cut, but simply continues to flow gently. This point is very important in injuries, because it indicates whether an artery or a vein has been cut.

Nerves

The brain is located inside the skull and is connected up with the spinal cord which lies in a canal inside the back bone. From the brain and the spinal cord, small nerves branch out to all parts of the body. These correspond in many ways to telephone lines with a central exchange (the brain). The nerves carry messages either from any part of the body to the brain, or from the brain to the part. These messages cause the muscles to contract, or if from the other direction give a sense of pain. To explain—if one of the nerves is touched with a hot iron or the skin over it is touched, a sense of pain is felt because one of the nerves carried the message to the brain. As soon as the pain is felt in the brain, a message is sent out over one of the nerves, to a bundle of muscles and the part touching the hot iron is jerked away. In this way, the whole body is bound together into a unit. See Figure 7.

The Digestive Tract

The body receives its nourishment by digesting food substances taken into it through the mouth. An illustration of the digestive tract is shown here. Figure 8. The first part of the digestive tract is the mouth, including the teeth, which prepare the food for the use of the stomach. The food is chewed, mixed with saliva and swallowed. It goes to the stomach where a further process of digestion occurs. From there, it goes into the intestine or gut, where a part of it is

FIG. 7.—Nervous system

absorbed into the blood for use in the various parts of the body as fuel. The remainder passes down into the great bowel and eventually is expelled as stool.

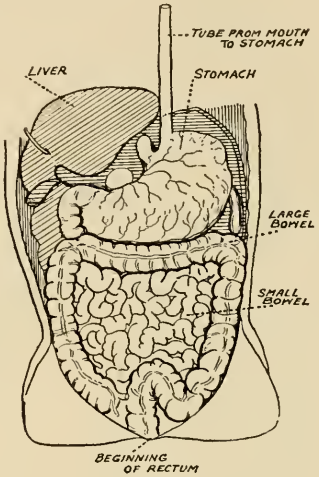


FIG. 8.—Digestive system.

The Kidneys and Bladder

Water, together with certain poisons formed in the body, is thrown off through the kidneys, which are shown in the accompanying illustration. Figure 9. The kidneys take water from the blood. From the kidneys it flows through two little tubes to the bladder and from the bladder is expelled in the form of urine.

The Lungs

Air is taken into the body through the windpipe which leads into the chest from the throat. This tube divides and subdivides until finally the tubes end in tiny air sacs. These air sacs are grouped into organs called lungs which are located in the chest, as shown in Figure 10.

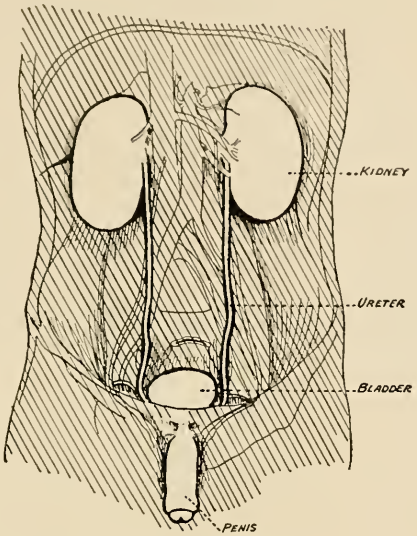


FIG. 9.—Urinary tract.

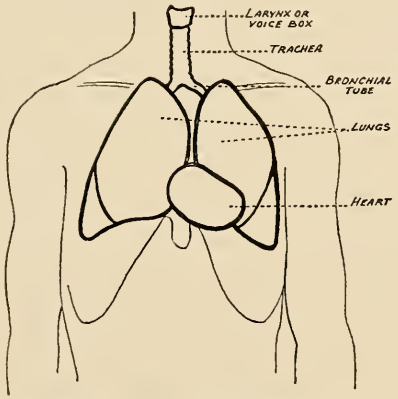


FIG. 10.—Organs of respiration and their relation to the heart.

TEMPERATURE AND PULSE

Normal Temperature

The body normally has a certain fixed temperature. This temperature is 37 degrees on the Centigrade scale or 98.6 degrees on the Fahrenheit scale. An illustration of a clinical thermometer is shown here. Figure 11. Very little practice will teach the method of telling temperature by means of it.

FIG. 11. Fahrenheit scale.

Taking Temperature

Before taking temperature with a clinical thermometer, clean it carefully by wiping it with a piece of cotton wet with alcohol. As clinical thermometers are self-registering; before using, the mercury must be shaken down below the normal mark on the tube. This is done by giving the thermometer a sharp swing and jerk while holding it bulb end down in the hand.

The temperature is taken by putting the mercury end of the thermometer under the patient's tongue and leaving it there for at least two minutes; after which the thermometer is removed and the temperature read. In case the patient is unconscious, or if for any other reason cannot hold the thermometer under the tongue, the bulb may be greased and inserted into the rectum for about one and one-half inches. The rectal temperature will usually be slightly higher than the mouth temperature (about 1 degree). The temperature may also be taken by putting the mercury bulb in the arm pit and holding the arm to the side for 2 or 3 minutes. The reading taken under the arm will be about one degree lower than the temperature by mouth.

After use, the thermometer should be cleansed by washing it with soap and cold water after which it should be placed in a solution of 2 per cent carbolic, 1:1000 bichloride or in alcohol for a few minutes before putting it away in the case.

The Fahrenheit scale is used throughout this book.

Fever

Marked variations from the normal temperature usually means disease. In fever, the temperature may go as high as 106 degrees Fahrenheit (41 degrees Centigrade), though this temperature is rather unusual. Due to exposure to cold or following a severe shock or injury with loss of blood, either internal or external, the temperature will probably drop below the normal and may be as low as 95 degrees Fahrenheit (36 degrees Centigrade). A temperature much below the normal is sometimes an indication of grave danger to an ill or injured person, although at times temperatures are found which normally are less than 98.6 degrees Fahrenheit (37 degrees Centigrade). Since the diagnosis of disease depends somewhat on the fever picture, in cases of illness, it is well to take the temperature at least twice a day, morning and evening, and to record it in such a manner that it can be shown to the physician at the first opportunity.

Pulse

The pulse is the thump felt in an artery with each beat of the heart. In illness, a record should be made of the pulse rate, since it affords valuable information regarding the disease condition. The normal pulse in the adult male varies from 70 to 90 beats to the minute. The pulse is best taken by using the index and middle fingers of the right hand, the tips of which are placed in the hollow on the underside of the wrist of the patient just above the base of the thumb. Very light pressure should be made, as more marked pressure will shut off the

pulse entirely. The accompanying illustration shows the proper method of taking the pulse at the wrist. Figure 12.

The pulse rate may also be taken under the angle of the jaw, the inside of the ankle, or in front of the ear. There is a fairly

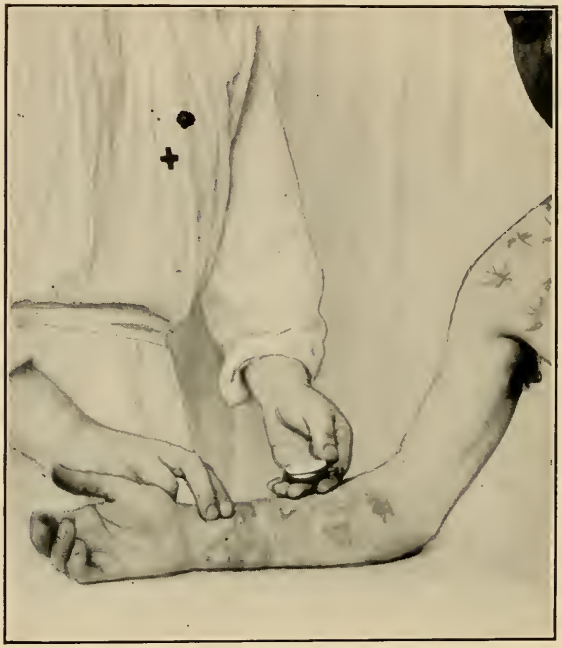


FIG. 12.—Proper method of taking the pulse.

constant relation between the pulse rate and the temperature. If the temperature is 98.6 degrees Fahrenheit, the pulse rate is 76; if the temperature goes to 104, the pulse will usually increase to 100 or 110 or higher; so that a fair idea of the temperature can often be gained by the rapidity of the pulse.

PART V

SHIP'S SICK BAY (HOSPITAL) AND MEDICINE CHEST

Before proceeding further with a description of actual medical and surgical conditions and their care, it is desirable to take up in some detail a discussion of hospital requirements aboard merchant vessels as well as to become acquainted with the medicine chest and its contents. Under the law (see note, page 59), it is necessary that merchant vessels make suitable provision for the isolation of contagious diseases and for the treatment of such illness and injuries as may occur during the voyage.

It is true that a room containing bunks and the medicine chest will answer the actual legal requirements. However, at a comparatively slight cost, a small hospital and dispensary can be fitted up which will serve a very useful purpose aboard, and which will, if properly planned, occupy no more space than the haphazard hospital arrangement which is too often found on board merchant vessels.

Hereafter, for our purpose, we shall designate that space devoted to dispensary, dressing room, hospital bed space and the toilet facilities in connection therewith as the "sick bay." The sick bay will vary in size according to the number of men in the crew, and in the ordinary freighter may contain space for the hospitalization of from two to eight persons.

The location of the sick bay will, of course, depend somewhat on the construction of the ship. It should be easily accessible if it is to be used as a dispensary, a place in which

to keep the medicine chest and a place for the treatment of minor injuries and illness. It should be located where there is good ventilation at all times and also where there is plenty of light. If the sick bay is so located that sunlight is not available, a good system of artificial lighting is essential.

Whatever type of sick bay is provided, arrangements should be made for proper toilet facilities. Flush closets are, of course, desirable. If for any reason they cannot be installed, a seat with a bucket beneath it should be provided in place of the flush closet.

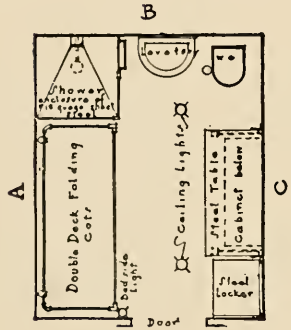
It is also desirable to have a lavatory or sink with running fresh water. This may serve as a place where the hands of any one doing surgical dressings or minor operations may be scrubbed, and also as a lavatory for patients confined in the hospital.

The accompanying illustrations, Drawings 1 and 2, have been carefully worked out as suggestions for the utilization of that space given over to hospital purposes. It is, of course, not essential to use this particular plan but an endeavor has been made to encompass in as small a space as possible all the necessary items which should be in the sick bay.

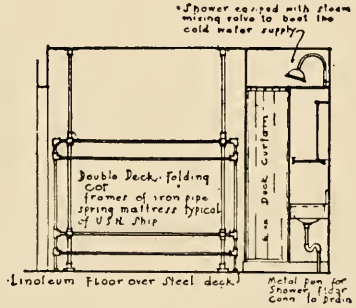
Drawing No. 1 illustrates the requirements for a 2-bed sick bay, together with the accessory space for shower bath, water closet, lavatory, etc. The bed arrangement consists of 2 beds in tier. These beds are of the Navy type with pipe frames affixed to stanchions from which the beds may be removed, if necessary, and utilized as litters.

Drawing No. 2 illustrates a somewhat more elaborate "bay" with hospital bed space for either 4 or 8 persons, according to requirements. In addition, a separate compartment has been provided which may be used as a dispensary and dressing room.

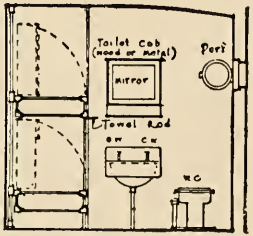
The medicine chest required by law, containing such surgical instruments, medicines and medical comforts as are necessary for the treatment of diseases or accidents incidental to sea voyages, is illustrated in the accompanying drawings.



PLAN


Shower equipped with steam mixing valve to heat the cold water supply
Double Deck Folding Cot frames of iron pipe spring mattress typical of U.S.N. Ship
Deck Curtain
Linoleum Floor over Steel deck
Metal pan for Shower Floor Conn to Drain

ELEVATION A

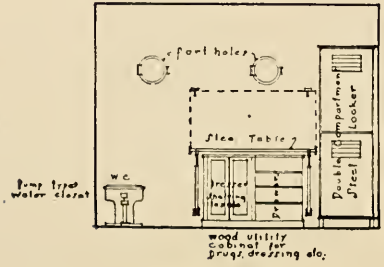


ELEVATION B

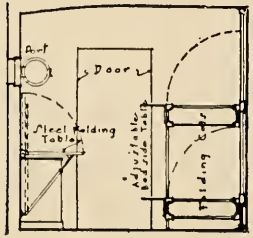
SCHEME FOR A DOUBLE COT SICK BAY ON VESSELS OF THE U.S. MERCHANT MARINE.

SCHEME TO BE PLANNED FOR INSTALLATION ON ANY CLASS OF VESSEL AS TO FIXTURES, EQUIPMENT ACCESSORIES ETC.

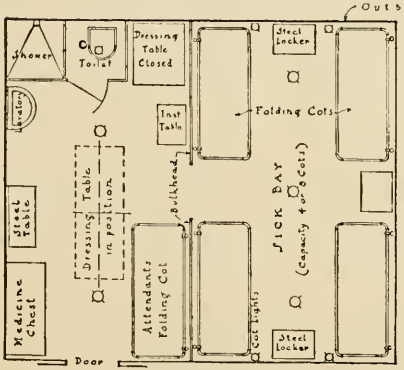
DRAWING No 1



ELEVATION C



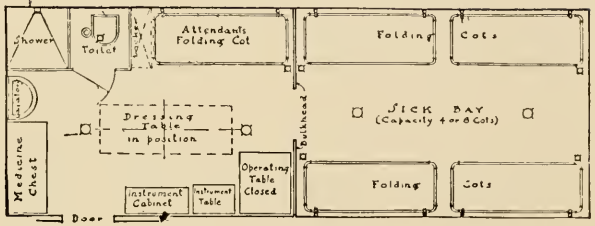
ELEVATION D



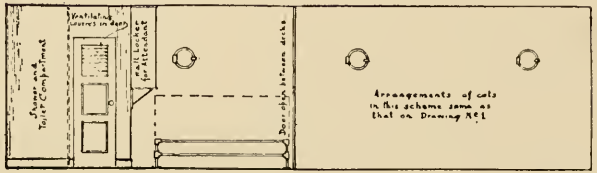
· PLAN · SCHEME No2 ·
SCALE ½"-1.0"

Notes
The general selection of Fixtures Furniture and all other requirements to be the same for all schemes but adapted to the size and conditions of space available on vessels.

SCHEMES FOR 4 or 6 COT SICK BAYS
VESSELS OF THE U.S MERCHANT MARINE
· DRAWING No2 ·



· PLAN · SCHEME No3. ·



· ELEVATION ·
SCALE ½" 1.0"

MEDICINE CHEST

The medicine chest should be equipped with the drugs and appliances listed below. Following this list, each drug is taken up individually and directions are given for its use and instructions as to when it is to be used. There is also a list of surgical instruments and appliances for first aid work. The directions for their use will be found under surgical first aid.

DRUGS AND CHEMICALS

Note. In preparing this manual, we realize the convenience of a uniform international list of medicines which should be required on all vessels. No such list exists and until such is prepared, we are compelled to compile what is regarded by us as satisfactory.

Cathartics

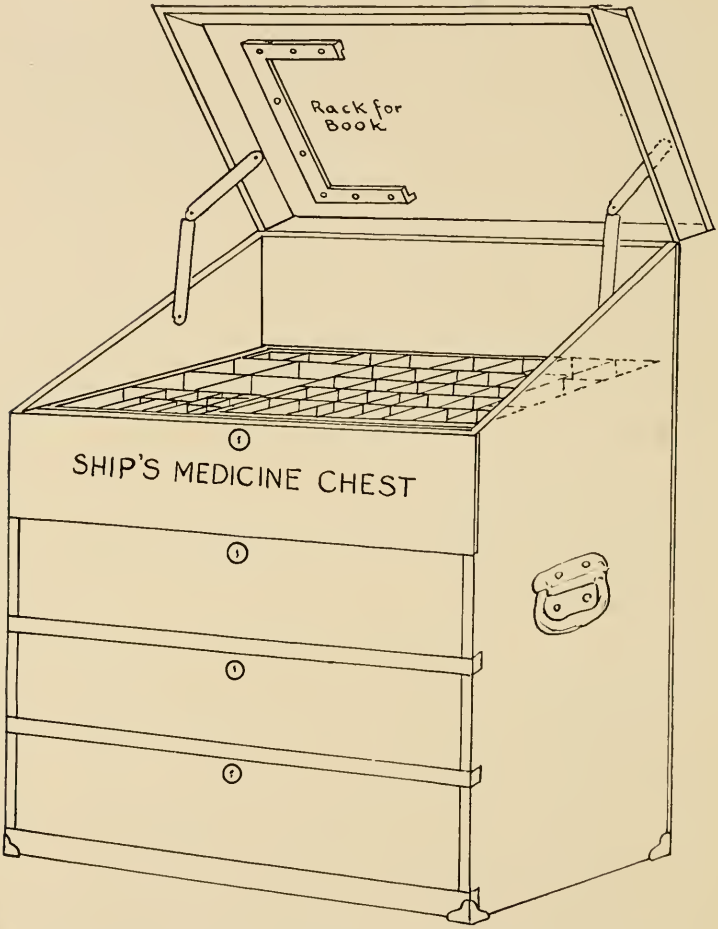
1. Calomel tablets (grains ½), 500.
2. Castor Oil, 1 quart.
3. Compound Cathartic (C.C.) Pills (vegetable), 1000.
4. Salts (Epsom), 4 lbs.

Hypodermic Tablets

5. Morphin Sulphate (grains ¼), 50.
6. Apomorphin Hydrochloride (grains $\frac{1}{10}$), 25.
7. Novocain and Adrenalin (grains 1), 100.
8. Strychnin Sulphate (grains $\frac{1}{30}$), 100.

Tablets, Pills and Capsules for Internal Use

9. Aspirin (tablets—grains 5), 1000.
10. Codein and Terpin Hydrate Tablets, 500.
11. Copaiba and Santal Oil (capsules—5 drops of each), 1000.
12. Ipecac (Alcresta) (tablets—grains 5), 100.
13. Quinine Sulphate (capsules—grains 5), 1000.
14. Sodium Bicarbonate (tablets—grains 5), 1000.
15. Sun Cholera (tablets—grains 5), 250.



According to the U. S. Public Health Service. Plans and specifications may be obtained by addressing that Service at Washington, D. C.

Ointments

16. Petrolatum (Vaseline), 2 lbs.
17. Ichthyol Ointment (20 per cent.), 1 lb.
18. Mercury Ointment, 2 lbs.
19. Sulphur Ointment, 2 lbs.
20. Calomel Ointment, 30 per cent., 3 lbs.

External Use Only

21. Oil of Cloves, 1 ounce.
22. Cocain Solution (1 per cent.), 1 ounce.
23. Carbolic Acid (pure), 1 lb.
24. Tincture of Iodine, 16 ounces.
25. Mercurochrome solution, 1%, 16 ounces.
26. Turpentine Liniment, 4 qts.
27. Potassium Permanganate (tablets—grains 1), 250.
28. Argyrol Solution, 20 per cent., 16 ounces.

Powders

29. Boric Acid, ½ lb.
30. Bismuth Subnitrate Powder, 1 lb.
31. Calomel Powder, 1 lb.

Antiseptics and Disinfectants

32. Bichloride of Mercury (tablets—grains 7½), 500.
33. Cresol Solution (compound), 1 lb.
34. Soft Soap (surgical), 1 lb.
35. Sulphur (roll), 100 lbs. (See page 33, bottom.)
36. Carbolic Acid (crude), 10 lbs. (See page 33, bottom.)
37. Calcium Hypochlorite—(tablets—grains 15), 500; or Chloride of Lime in 1 lb. cans (½ dozen).

Miscellaneous

38. Alcohol (grain), 1 quart.
39. Chloroform (½-ounce vials), 6.
40. Paregoric, 8 ounces.
41. Tincture of Myrrh, 4 ounces.

SURGICAL AND GENERAL SUPPLIES

1 Pair Bandage Scissors.
2 Pair 6 inch Pointed Scissors.
1 Pair Heavy Blunt Scissors.
6 Artery Forceps.
1 Pair Tissue Forceps.
1 Pair Dressing Forceps.
3 Knives—2 Operating—1 Pointed Bistoury.
12 Silk Ligatures on Needles in Tubes.
12 Assorted Needles (surgical).
4 Catheters, rubber (assorted).
1 Catheter, metal.
2 Probes, silver.
500 Wooden Tongue Blades.
12 Tubes Catgut.
6 Tubes Linen.
2 Dozen Safety Pins.
1 Tourniquet.
2 Bdls. Yucca Board.
2 30-inch Basswood Splints.
100 Compressed Bandages—3 inch.
25 Compressed Bandages—1½ inch.
3 Clinical Thermometers (Fahrenheit).
2 Hypodermic Syringes.
8 Rolls Adhesive Plaster—1 to 4 inches, assorted—5 yards.
50 Yards Gauze, Sterile, in 10 yard lots.
2 Dozen packages Gauze—1 yard each.
4 Pounds Absorbent Cotton.
6 Muslin Bandages, Triangular.
2 Yards Gauze Iodoform.
1 Foot and Leg Splint.
12 Roller Bandages, Muslin.
4 Hand Brushes, good quality.
12 Urethral Syringes.
1 Fountain Syringe.

1 Urinal, Enameled.
1 Weight and Pulley.
10 Yards Muslin.
2 Rubber Sheets.
4 Sand Bags.
12 Suspensory Bags.
6 Flannel Bandages.
1 Bed Pan.
6 Medicine Droppers.
2 Feeding Cups.
5 Yards Flannel.
2 Hot Water Bags.
2 Ice Bags.
1 Foot Bath.
12 Medicine Glasses.
6 Graduated Glasses.

The quantities given above are estimated to be sufficient for a vessel carrying about 100 persons on a voyage of about one month. Quantities may be reduced for a smaller personnel or for shorter voyages.

CATHARTICS

1. Calomel in ½ Grain Tablets.

Calomel is a compound of mercury and is a strong mineral cathartic. It can be given in doses of one to five grains but should not be used frequently as it tends to cause mercury poisoning. For any condition where a thorough cleaning out is necessary, calomel is best given in ½ grain doses; ½ grain every 20 to 30 minutes until six doses have been given. After a period of four hours, this is followed by a dose of either epsom salts or castor oil. By following the calomel with salts or oil, the mercury is worked off and poisoning will not occur. If desired, calomel can be given in one dose instead of broken doses. If one dose is given, it should be of from three to five

grains and followed several hours later by salts or oil, just as in the case of broken doses.

2. Castor Oil.

Castor Oil is a vegetable cathartic and is comparatively harmless even in very large doses. It should be given in doses of from two to four tablespoonfuls (one to two ounces) at a time. This is one of the safest cathartics that can be used but is disagreeable to the taste. By giving it in lemon juice with the addition of a pinch or so of bicarbonate (baking) soda, the taste is not so noticeable.

3. Compound Cathartic or C.C. Pill (Vegetable).

These are, as their name indicates, cathartic pills. They are given in doses of from one to three pills and should be followed by a swallow of water. They are a safe and efficient cathartic. Like many purgatives they are best taken at bed time.

4. Epsom Salts.

Epsom salt is also a good cathartic. It produces a profuse watery stool and may be used after calomel in place of castor oil or it may be used alone as a cathartic. Epsom salt is given in doses of from two to six heaping teaspoonfuls of the dry salt, mixed in water. If the salt is given in hot water, a tablespoonful or more to the glass, the action is more prompt and efficient.

TABLETS—Hypodermic

5. Morphin Sulphate.

Caution.—Read directions carefully before using.

Morphin sulphate is one of the most important articles in the medicine chest. Morphin is the most effective drug known for the relief of pain and is used for this purpose only. It is a habit forming drug and should be kept carefully locked up. It is not to be used except in case of very severe pain but when it is needed for this purpose, nothing else will take its place. Given in sufficiently large doses, it will completely relieve pain,

though in larger doses it may cause death. It is given to adults in ¼ grain doses by hypodermic or by mouth though the effect when given by hypodermic is more prompt and pronounced. If the pain is not considerably relieved in one-half hour after giving, the dose should be repeated. Under no circumstances should more than one grain of morphin be given by mouth within a period of four hours, nor more than one-half grain of morphin by hypodermic in the same length of time. (For use of the hypodermic, see page 127.)

6. Apomorphin Hydrochloride.

Caution.—Read directions carefully before using.

Apomorphin hydrochloride is used for an entirely different purpose than morphin. It is used hypodermically to cause vomiting, especially in cases where some person has swallowed poison and it is desired to empty the stomach at once. Injected by means of the hypodermic in $\frac{1}{10}$ grain doses, it will cause vomiting within ten minutes. Not more than one dose should be given and this dose should not exceed $\frac{1}{10}$ grain.

7. Novocain and Adrenalin.

Caution.—Read directions carefully before using.

Novocain and adrenalin is used to produce local anesthesia or insensibility to pain. This drug when mixed with water and injected in the skin, will cause an absolute numbing and loss of pain sense in that part immediately around the site of the injection. Novocain is used in one per cent. solution for injection, so that to make the proper strength solution one grain tablet is added to one and one-half teaspoonfuls of water and allowed to dissolve. This solution, properly used, is almost harmless and as much as 10 or 12 tablets can be injected if necessary, to cover a good sized area.

8. Strychnin Sulphate.

Caution.—Read directions carefully before using.

Strychnin sulphate is a strong stimulant and is used where the breathing and heart action are poor and it is desired to

"whip them up." It can be given hypodermically, or by mouth, in doses of $\frac{1}{30}$ of a grain. This can be repeated every three hours, if necessary.

TABLETS, PILLS AND CAPSULES FOR INTERNAL USE

9. Aspirin.

Aspirin, in five grain tablets, is an extremely useful drug. It is given to reduce fever, for headaches, for rheumatism or pain in the joints and muscles, and for colds. The drug is used in doses of one to two, five-grain tablets, which may be repeated every four hours if necessary. No more than sixty grains should ever be given in twenty-four hours, and the use of this quantity should not be continued for more than three days at a time. It can be given in small doses, five grains every four hours over periods of days. Aspirin should be taken with water or milk or with a little food, as it tends to upset the stomach.

10. Codein and Terpin Hydrate Tablets.

This is an excellent combination of drugs which is used for the control of cough. These tablets are taken in doses of one or two every three hours for cough, if necessary. They are best followed by a swallow of water.

11. Copaiba and Santal Oil—5 drops each.

Copaiba and santal oil capsules, containing five drops of each of these drugs, are used in the treatment of acute gonorrhea, "clap," especially during the stage in which there is a considerable amount of burning on passing water. This mixture does not have a curative action but merely relieves the burning. From two to three of these capsules three times a day during the acute period of the disease will greatly aid in the relief of the pain.

12. Ipecac (Alcresta)—Grains 5.

Ipecac, Alcresta, is used largely in the treatment of amoebic dysentery. These tablets are better than the ordinary ipecac

preparation because they do not cause nausea. They are taken in doses of from one to three tablets, three times a day as long as the dysentery continues. Ipecac is useful only in that form of dysentery caused by the amoebae.

13. Quinine Sulphate Capsules—Grains 5.

Quinine is the one and only drug to be used in the treatment of malaria or in the prevention of malaria. As a preventive, while in a malarious district, quinine should be given in doses of not to exceed ten grains daily. The drug is used in obscure fevers in five or ten grain doses every four hours. In malaria, it is given in doses of ten grains or less every four hours, until two hundred grains have been given, when it is discontinued for a period of twenty-four to forty-eight hours, and then another series of doses is taken.

14. Sodium Bicarbonate—Grains 5.

Sodium bicarbonate, or baking soda, in five grain tablets, will be found very useful for the relief of "heartburn" or distress in the stomach after eating (indigestion), and can be given in almost any amount without doing any damage. The tablets should be dissolved in a little water before being taken or should be crushed and taken as a powder. During the acute stage of gonorrhea, 20 grains of sodium bicarbonate and a glass of water taken every two hours will help to relieve the pain on urination.

15. Sun Cholera Tablets.

Sun Cholera Mixture, which contains several of the hot oils and a small amount of opium, is put up in tablets of five grains each. This mixture is used to relieve the distress in cramps and diarrhea, as well as to reduce the number of stools. These tablets are taken in doses of one or two every three hours until relief is obtained.

OINTMENTS

16. Petrolatum (Vaseline).

Petrolatum is a substance which is used wherever a lubricant is needed about the body or wherever a non-irritating dressing is needed for a wound or sore, and is used to dilute or thin other lubricants which may be too stiff. It is an excellent dressing for burns as it excludes the air and reduces pain to a minimum. As a surgical dressing, petrolatum should be sterilized by putting the container in a bath of boiling water and heating it at that temperature for twenty or thirty minutes. A convenient method of carrying petrolatum is to have it put up in collapsible tubes.

17. Ichthyol Ointment—20 Per Cent.

Ichthyol Ointment is an excellent substance for the relief of local pain and swelling, especially around joints. It is valuable also in the treatment of swollen testicles. It is used by smearing a thick layer of it over the sore or tender part and covering with a dressing.

18. Mercury Ointment.

Mercury, or blue ointment, will be used aboard ship to get rid of crab lice. It is occasionally used as a dressing for ulcers and sores, especially leg ulcers. For getting rid of crab lice, it is smeared over the hairy parts and allowed to remain from one to two days. After which the parts are to be well washed in soap and water.

19. Sulphur Ointment.

Sulphur ointment is used chiefly to get rid of scabies or itch. It is also used in many skin diseases, especially those affecting the scalp. When using sulphur ointment to get rid of itch, the body should be rubbed thoroughly for three successive nights without a bath, following which, the underclothes are changed completely and a thorough bath is taken. It may be necessary to repeat this treatment a second time.

20. Calomel Ointment—30 Per Cent.

Calomel ointment is used occasionally as an antiseptic ointment in dressing ulcers and similar conditions.

Its chief value is as a prophylactic against syphilis. After intercourse, a thorough application of this ointment should be made to the penis, scrotum and pubes, after which it should be rubbed in thoroughly for at least five minutes. If this is done carefully within an hour after intercourse, the danger of the individual contracting syphilis is markedly reduced. It should not be washed off for several hours.

EXTERNAL USE ONLY

21. Oil of Cloves.

Oil of cloves is included in the medicine chest as a remedy for toothache.

If a cavity exists in a tooth a very small ball of cotton saturated with oil of cloves and packed into the cavity will usually promptly relieve the ache. The cavity should be cleansed out if possible before inserting oil.

If oil of cloves is not available pure carbolic acid may be used in the same way but must be used with caution or it will burn the mouth and tongue (see No. 23).

22. Cocain Solution—1 Per Cent.

Cocain is a valuable local anesthetic but absorbed into the system in any large amount, it causes severe poisoning, sometimes death. This solution is carried in the medicine chest for one purpose, and that is the removal of foreign bodies from the eye. To do away with the sensitiveness of the eye ball, one drop of 1 per cent. cocain solution is dropped on the eye ball. This is repeated every three minutes until three drops have been instilled, when it will be found that foreign bodies can be removed from the surface of the eye ball without pain to the patient.

23. Carbolic Acid—Pure. POISON.

Caution.—Read directions carefully before using.

Carbolic acid (pure), is a very strong caustic and is used largely for cauterizing purposes. It is also a strong antiseptic. (For its use as an antiseptic, see No. 36.) Carbolic acid is also useful to stop toothache. A very small amount of it put on a bit of cotton and inserted into a hollow aching tooth will relieve the pain.

Carbolic acid even in weak solutions should never be used for dressing wounds of any kind. When applied to the skin for a length of time it may cause gangrene. If spilled on the skin accidentally it can be removed best with alcohol applied promptly.

24. Tincture of Iodine.

This substance is the best all-round antiseptic to use on or about the body. Before a boil is opened, the skin over it is painted with tincture of iodine. Before any operation, the skin about the site of the operation is painted with tincture of iodine. Before a cut or wound is sewed, its edges are painted with tincture of iodine. It is also used to paint over sore joints or bruises or sprains. Care should be taken not to apply this substance in strong solutions and then cover it over with cloths as it may blister the skin and at times even cause the skin to slough. Any excess of it can be removed by washing the skin with alcohol. After a time, due to evaporation, it is likely to become too strong. It may be weakened by adding some grain alcohol.

25. Mercurochrome Solution.

This substance is a comparatively new but effective surgical antiseptic which is used as a one or two per cent. watery solution in much the same way as tincture of iodine. It possesses the advantage over iodine of not being irritating when painted into open wounds or on the skin. It may be used to sterilize the skin before operation or to paint into and about wounds before they are stitched or bandaged. This solution

is also excellent as a prophylactic against gonorrhea and for this purpose is used in a strength of 1 per cent. as an injection, in place of argyrol or protargol.

26. Turpentine Liniment.

Turpentine liniment is a good, all-round liniment for use in soreness, bruises, sprains, etc., though quite as much benefit comes from the rubbing as from the liniment itself. Turpentine liniment is very strong and in tender skinned individuals may cause blistering.

27. Potassium Permanganate.

Potassium permanganate in solution is used in the treatment of acute or chronic gonorrhea, "clap," and as an antiseptic wash for any sore or ulcer, especially those having a bad odor. One, one grain potassium permanganate tablet added to a quart of warm water makes a solution of about the right strength for injection in case of gonorrhea. This is also about the proper strength for an irrigating solution or for a wash. Should the solution lose its color make up a fresh solution.

28. Argyrol Solution—20 Per Cent.

Argyrol is a silver preparation which has a strong germicidal action on certain types of bacteria, especially the germ which causes gonorrhea.

In 20 per cent. solution in water it is quite valuable as a prophylactic against gonorrhea.

If within an hour or two following intercourse an injection of 20 per cent. argyrol solution is made into the urethra and the drug held there for at least one minute, the danger of the individual contracting gonorrhea is much reduced.

Argyrol solution in this strength is also used in cases of conjunctivitis and in reddening and inflammation of the eyes. After douching the eyes with saturated boracic acid solution, drop one or two drops of argyrol solution inside the lower lid near the outer corner of the eye. For use in the eye, if the solution seems too strong and causes burning, dilute it with an equal amount of distilled or boiled water.

After being kept a while, especially when exposed to light, it should be discarded and a fresh solution prepared.

POWDERS

29. Boric Acid.

Boric acid powder is used as a dressing for wounds wherever it is desired to use some mild antiseptic dressing. Boric acid is also used in making a solution to be used as an eye wash. Four level tablespoonfuls of boric acid dissolved in one pint of boiling water makes a satisfactory eye wash. This is the right strength for wet dressings for wounds or burns.

30. Bismuth Subnitrate Powder.

Bismuth powder is used occasionally for the treatment of wounds, although, ordinarily, it is used in quarter level teaspoonful doses to stop excessive bowel action in diarrhea. Mix it with water or take dry and follow with water.

31. Calomel Powder.

Calomel powder is used as a dressing for wounds, sores and ulcers, especially those occurring about the genital organs. It is valuable as a dusting powder wherever an antiseptic dusting powder is needed.

ANTISEPTICS AND DISINFECTANTS

32. Bichloride of Mercury. POISON.

Caution.—Read directions carefully before using.

Bichloride of mercury is a poison and should be handled as such. It comes in tablets containing 7½ grains each. It is used in solutions as an antiseptic wash and as a wet dressing for soaking infected wounds. As a wash it is used in strengths of 1 to 2000 or one tablet of bichloride to a quart of water. For wet dressings or for the soaking of wounds, it is used in strengths of 1 to 5000 or one tablet to each 2½ quarts of water. The other form of bichloride carried is the crude powdered bichloride. This is used for scrubbing infected decks, walls,

bunks, etc., or for soaking infected bed clothes or linens. It is usually used in strengths of 1:1000. In quantities, this is made up by adding one teaspoonful of powdered bichloride of mercury to a gallon of water. **Bichloride of mercury must not be used internally.**

33. Compound Cresol Solution. POISON.

Caution.—Read directions carefully before using.

This substance is used as a disinfectant only. It should never be taken internally and should very rarely be used on the body. It is an excellent disinfectant for scrubbing infected surfaces, for soaking clothes or for disinfecting discharges from those sick with infectious diseases. It is used in from 2 per cent. to 5 per cent. solutions. A 2 per cent. solution is made by adding approximately one tablespoonful of pure cresol solution to each quart of water.

34. Soft Soap (Surgical).

Soft soap is used for scrubbing the hands and arms before any surgical operation is performed; for scrubbing the part on which the operation is to be performed, and for any other use where a good soap is required.

35. Sulphur (roll).

Roll sulphur is carried as an emergency fumigating agent for the destruction of rats, mice and mosquitoes as well as germs. For directions for its use, see chapter on fumigation.

36. Crude Carbolic Acid. POISON.

Caution.—Read directions carefully before using.

Crude carbolic acid is used as an antiseptic in much the same way as cresol. It is used in a 5 per cent. solution for washing down decks, walls, bunks, or for soaking clothes and disinfecting discharges from persons for the purpose of sterilizing them. A 5 per cent. solution is made by using 50 parts alcohol, 50 parts carbolic acid, pure, and 900 parts fresh water.

37. Calcium Hypochlorite (tablets); Chloride of lime (bleaching powder) in cans.

Calcium hypochlorite or chloride of lime is used for sterilizing infected or suspicious drinking water. One tablet (15 grains) is crushed and made into a paste with a little water. This paste is added to each barrel of water to be treated, and, after stirring, allowed to stand one-half hour before use. Powdered chloride of lime may be used in the same way as the tablets, ¼ to ½ teaspoonful of the powder being used instead of a tablet. Mix well.

MISCELLANEOUS

38. Alcohol—grain.

Caution.—Read directions carefully before using.

Grain alcohol can be used internally in cases of shock or collapse or after prolonged exposure. It is used in the same way as whiskey, after mixing with an equal amount of water. The quantity should be one-half less than whiskey. Denatured alcohol is used as an antiseptic, especially for rinsing the hands before a wound is dressed or before an operative procedure is performed or for washing the skin of the patient before a cut is made. Denatured alcohol is never used internally in place of whiskey. Be sure that you have only pure grain alcohol for internal use. **Do not use denatured or wood alcohol internally.**

39. Chloroform.

Caution.—Read directions carefully before using.

Chloroform is an anaesthetic which is used for producing sleep during painful surgical operations, etc. It is used by having the patient breathe its vapor. It is highly dangerous and should not be used by any one not skilled in its use except in case of absolute necessity.

If possible the patient who takes it should have an empty stomach (no meal for some hours beforehand). The patient, lying down, is given chloroform by placing over his mouth and

nose a mask of some kind upon which the chloroform is dropped slowly while he breathes the vapor. In the absence of a mask, a piece of cloth may be used over the mouth and nose held up off the skin. Chloroform is irritating to skin and eyes. It is well to protect skin by greasing with vaseline.

During its administration respiration and pulse must be watched with great care.

40. Paregoric.

Paregoric is a valuable drug which is used chiefly to stop abdominal cramps and griping. As it is an opium compound, in larger doses, it may also be used to relieve pain, though if the pain is severe morphine is usually indicated. It is given to adults in doses of from one to three teaspoonfuls and may be repeated if necessary.

41. Tincture of Myrrh.

Tincture of myrrh is a valuable remedy for use in the mouth and on the gums, especially in case of scurvy or in cases of mercury poisoning, in which the teeth have become loosened and the gums are sore. A few drops of tincture of myrrh sprinkled on the tooth brush before brushing the teeth, or rubbed on the gums will do a great deal to harden them and prevent sore mouth.

Foods for the Sick

While not exactly a part of the ship's medicine chest, nevertheless provision should always be made on every vessel for feeding those who may be taken sick on the voyage. There should be included in the ship's stores a moderate quantity of such articles as canned soups and broths (small), beef extract in one form or another (there are convenient cubes on the market), some form of gelatin, easy of preparation, some acceptable form of powdered milk, or malted milk, or both, crackers or biscuits in tins, and of course oatmeal and barley for gruels and soups. Tea, coffee, cocoa or chocolate will be found useful.

PART VI

MEDICAL FIRST AID

General Considerations

Under the chapters on medical and surgical first aid, various individual diseases and conditions are discussed, but before these diseases are studied, certain highly important general considerations must be taken up and thoroughly understood, in order properly to care for cases of illness occurring aboard ship.

Even for the doctor, it is often difficult and sometimes impossible to correctly diagnose (name) the disease from which a patient is suffering. However, much can be done for him by treating his symptoms (those things of which he complains).

The general care and nursing of the sick are frequently of more importance than medicines. Too much treatment, especially too much medicine, is worse for the patient than too little. On board ship the treatment of a sick man is often difficult, but rest in bed, proper feeding and some general care are nearly always possible and in many cases are all that is needed in order to restore him to health.

Remember that sick people are not "themselves" and that tact and patience are required in caring for them. Also bear in mind the fact that mistakes are easily made and that it is better to let one man play sick and "get away with it" than to refuse a really sick man rest and care because he is suspected of "faking."

Any one who is sick, has fever, or feels generally bad, should go to bed.

If there is any suspicion that the individual is suffering from communicable disease, he should be put to bed in the sick bay or hospital or should at least be isolated from the rest of the crew.

As noise is usually very annoying to the sick, especially to those who have fever, the bed should be located in a quiet place.

The room should be properly heated, well ventilated, and above all places on the ship, should be free of vermin.

The Sick Bed

The bed for the sick man should be clean, and should be kept in that condition. It should be comfortable, with neither a very soft nor a hard mattress, but one which is smooth, firm and even. Hair mattresses are advised for the hospital as they stand sterilization better than others and do not so readily become lumpy and uneven.

The mattress should be covered with a removable cover of cotton sheeting. Before the bed is made up, a rubber sheet should be spread over the mattress in order to avoid soiling and soaking it should anything be spilled on the bed. Over this should be placed the cotton sheet or blanket on which the patient is to lie.

When a patient is put to bed he should be dressed only in night shirt or pajamas. He will be more comfortable when so dressed and will be more easily examined and treated.

Food and Drink

The food for the sick should be light and nourishing and as palatable as it is possible to make it. It should consist largely of broths, soups, milk (fresh or condensed), eggs, toast, boiled rice, custards, and similar substances.

If the patient has considerable fever, the food should consist

chiefly of fluids. Lemonade and other drinks made from acid fruits are grateful and are usually allowed freely.

The patient should be encouraged to drink plenty of water.

It may be necessary to feed him if he is very ill. In giving nourishment and water under such circumstances, use either a spoon or a goose-necked feeding cup in order to avoid the necessity of the patient sitting up to take nourishment.

Nourishment should be given at regular intervals, usually every two or three hours and water more frequently whether it is requested or not.

Care of Bowels and Bladder

In nursing the sick the care of the bowels and bladder are highly important. Usually the first treatment given in illness is for the purpose of bringing about a thorough bowel movement. Not only at the beginning but also during the entire course of the disease a thorough daily evacuation of the bowels is essential and when necessary may be accomplished by giving a laxative once in each 24 hours or by giving a daily enema.

Enemas

There are many kinds of enemas but the most useful is one consisting of simple soap water. It is prepared by mixing enough ordinary soap with warm water to make a good suds. No special soap is necessary as either white or brown are equally effective.

To give an enema, fill a fountain syringe with the warm soap solution. To the end of the tube of the syringe attach the small straight hard rubber tip which comes with the outfit, or if the patient's bowels do not move readily and it is desired to give a *high enema,* attach to the hard rubber tip either a soft rubber rectal tube or a good-sized rubber catheter. Grease the hard rubber tip or the end of the catheter with vaseline and with the patient lying on his left side with his knees

drawn up, gently insert the greased tip into the rectum, elevating the container of the syringe 3 or 4 feet above the level of the bed and allow from 1 to 3 pints of the solution to run into the rectum. If too much cramping occurs, lower the syringe a little in order to slow the flow of the solution. In giving a high enema the soft rubber rectal tube may be inserted into the rectum 8 or 10 inches and the solution run in in the same way.

If possible the enema should be retained in the bowel for 10 or 15 minutes before being evacuated.

Should a daily enema be required over a considerable period of time, in place of soap solution, use warm water in which is dissolved 1 heaping teaspoonful of ordinary table salt to each pint of water. This solution is not so irritating as soap water.

Care of Bladder

Should the patient be unable to void his urine, it may be necessary to catheterize him. When necessary this should be done 2 or 3 times in each 24 hours. For method of catheterization see page 167.

Use of Bed Pan and Urinal

Patients who are seriously ill should never be allowed to get out of bed in order to move the bowels or to pass urine; always use the bed pan and the urinal for them.

Bed pans and urinals must be carefully washed and, in cases of communicable disease, sterilized after use. They may be sterilized either by boiling or by immersion in cresol or carbolic solution.

Disposal of Excreta

All excreta (stool and urine) as well as the sputum and nasal secretions of the patient must be carefully disposed of. This is especially important when the individual is ill with

a fever or a communicable disease. In order to sterilize stool or urine, mix them with an equal part of 2 per cent. cresol or 5 per cent. carbolic solution and allow the mixture to stand for an hour before being emptied.

The same procedure may be used to sterilize sputum and nasal secretions though these may more readily be collected in paper cups or napkins and burned.

TOILET OF THE PATIENT

Care of the Mouth

The care of the mouth of the sick man is of considerable importance. This is especially true of fever cases, or those patients who are unconscious. Under such circumstances the mouth, unless cared for carefully, becomes very nasty.

The teeth should be brushed at least twice a day, preferably more often, and the mouth washed carefully with a solution of ordinary baking soda (sodium bicarbonate), using a level teaspoonful of soda to a glass of water. If the patient is helpless the tongue and teeth should be cleansed with cotton swabs soaked in this same solution.

Baths

In case of illness, baths are given either with the idea of cleansing the skin, or to reduce fever. As a large amount of poison is thrown off through the skin, it is quite necessary to keep it clean in order that the pores do not become clogged. For this reason a daily cleansing bath is advisable.

Cleansing Baths

When it becomes necessary to give a cleansing bath to a patient confined to bed, the attendant should provide himself with a basin of warm water, some soap and a wash cloth or sponge. After all the patient's clothing is removed, he should be covered with a blanket only.

First the face and hands are washed then dried; next take one arm and shoulder, then the other, washing and drying one part at a time until the whole body has been bathed.

Following the bath, it is advisable especially if the patient is very ill, to rub a little alcohol on the skin. This tends to harden the skin and helps to prevent bed sores. After the alcohol rub, the skin especially over the back and buttocks should be dusted with talcum powder.

In the case of very ill patients the alcohol rub and a thorough dusting with talcum powder following the bath are a real necessity and will do much in helping to prevent bed sores.

Sponge Baths to Reduce Fever

No procedure is more useful to reduce fever than the sponge bath. These baths should be given every 3 or 4 hours in cases of continuous fever where the temperature is above 103 degrees.

The temperature of the bath given, will depend on the degree of fever and the reaction of the patient to the bath.

At times a sponge with lukewarm water is effective, at other times the bath is given with water at ordinary room temperature. If the fever is high and the patient robust, ice water may be used. Actual chilling of the body of the patient is not desirable.

To give a sponge bath, strip the patient and cover him only with a sheet or a light blanket.

Using a sponge or cloth, first uncover the upper part of the body and sponge thoroughly, going over the skin several times until it is cooled. Continue this procedure until the entire body has been sponged. If the temperature is very high, the upper part of the body will have dried by the time the lower part is finished. If not dry, use a towel to complete the drying and if alcohol is available rub alcohol lightly over the skin of the entire body. The alcohol rub in itself is effective in reducing fever. After the bath, change the sheet

under the patient, if wet, and cover him lightly, leaving him without clothing for one-half hour.

Occasionally if the fever is very high, it may be desirable instead of giving a sponge bath to cover the patient with the sheet or light cotton blanket wrung out of cold water, leaving him so covered for 10 or 15 minutes. This procedure is quite effective at times in reducing a high fever.

LOCAL APPLICATIONS

Applications of heat or cold are often used in the treatment of the sick.

Cold Applications

Nothing is more grateful to a patient with fever and headache than a cold application to his head. Also, in cases of delirium, cold applications applied to the head often have a quieting effect. The most common method of applying cold is by the use of the ice bag.

In using an ice bag, fill it with cracked ice, screw the cap on tight, wrap with a towel and place where desired. If necessary it may be held in place with a bandage. Renew the ice as necessary.

Hot Applications

Heat is used to allay local cramping and pain or merely to promote the warmth of a part or in the form of a hot compress to take the place of the old style poultice.

For the purpose of applying heat the hot water bag is very convenient. In using it fill it about half full of hot water. Expel the air from the top of the bag and screw the stopper tight. Be sure it does not leak. It should be tested on the face or arm of the attendant to see that it is not so hot that it will cause a burn. If it is desired to apply heat, and no hot water bottle is available, an ordinary bottle or can filled with hot water is equally effective, if not so convenient.

Giving of Medicine

Medicine should be given regularly, usually with a little water. Care must be taken always to read labels and be sure the right medicine and the right dose is given. Do not guess at the dose, always measure it. Unless great care is exercised in these matters some one may be poisoned.

Keeping Records

Whenever possible a few notes should be kept regarding the patient and his illness; when he was taken sick and how, his progress each day and a record of his temperature and pulse. This information will be of value to the doctor when he sees the case. It also serves to show how the patient is getting along.

PART VII

GENERAL MEDICAL DISEASES AND THEIR TREATMENT

As noted previously, it may be impossible to be sure of the disease from which the patient suffers.

Often he never develops a definite disease but only shows certain symptoms which, while they may make him ill and incapacitate him for work, are not in themselves sufficient to constitute what we call a disease. These symptoms may be the beginning and end of the illness or, on the other hand, they may be only the forewarning of some definite disease. The proper course to pursue when a patient develops symptoms of illness is to treat them, and in the meantime observe him for possible developments.

Fever

Fever (an increase in body temperature above the normal 98.6 degrees Fahrenheit, 37 degrees Centigrade) is usually a symptom of some general disease though we may be unable to discover the cause of it when it first occurs.

It is commonly accompanied by flushing of the face, reddening of the eyes, an increase in the rate of the pulse (more or less proportionate to the height of the fever), often by a headache, backache, and a general feeling of illness. If the fever becomes high enough it may cause delirium.

General Treatment of Fever—Usually the man with a high fever feels ill enough to go to bed. If not, he should be sent

there anyway. While observing him for signs of some specific disease it is advisable to treat him for the fever. We usually start this treatment by giving a cathartic to clean out the bowels thoroughly. Aspirin is often given in doses of from 5 to 10 grains every 4 hours, as this drug induces sweating and helps bring down the temperature. Should there be reason to believe that the fever is the result of malaria, quinine will be given (see treatment of malaria). An ice cap applied to the head not only helps reduce the fever but decreases the headache. Sponge baths may also be given every 3 or 4 hours. They are especially indicated in prolonged fever. In case delirium occurs an attendant should remain with the patient all the time. It may be necessary to restrain him by tying him in bed with sheets. In addition to the treatment outlined above, it may be advisable to give a cold sheet pack as described under "Sponge baths."

The temperature should be taken with a thermometer every 4 hours and a record kept of it. In the meantime, observe the patient for rashes, skin eruptions, swellings, abscesses, etc., which may be the cause of the fever. During the course of a fever the patient should be on light or fluid diet.

Chills

Chills, like fever, are usually the warning of some general disease. They nearly always occur in conjunction with fever, the temperature mounting rapidly during the occurrence of the chill.

One of the common causes of chills and fever is malaria, though any of the general infections may bring about the same picture.

The chill may be either mild or severe. It may be merely a chilly feeling or the patient may become blue and shake with cold.

Treatment.—During the chill put him into bed, give warm drinks, cover him with blankets and use hot water bottles. At

the conclusion of the chill take his temperature, it will nearly always be high. In this case after the chill is over treat him for the fever, observing him closely to ascertain, if possible, the cause of the chill and fever.

Inflammation

Inflammation is the reaction which occurs in the tissues when any part of the body is injured.

The injury may be the result of mechanical force such as a blow, a stab or a gun shot wound; it may be caused by excessive heat (burn) or cold (freezing), or by the action of chemicals such as acids or alkalies or by the poisons produced by the growth or germs in the body, but in any case, regardless of the agent causing the injury, the reaction which occurs in the body as the result of it is known as inflammation.

The signs of inflammation are always the same though they may vary in degree according to the locality and the tissue which has been injured. The signs are pain, swelling, heat and redness.

When any of them are found they indicate that some form of injury has occurred to the part of the body affected.

Pain may be slight or acute, localized or general. The same holds true for swelling, which may be marked or so slight as to be hardly noticeable.

Heat may be noted only as a local increase in temperature such as occurs about a boil or it may be sufficient to cause fever.

Redness is noticeable only when the inflammation is located in or near the skin and is due to an increase in the amount of blood in the part.

Inflammation may occur anywhere in the body. It may be due to some condition which requires surgical treatment, such as a beginning abscess, or it may be due to a general injury of a part such as that brought about by the growth of germs, causing rheumatism.

General Treatment of Inflammation.—In treating any form of inflammation rest of the inflamed part is indicated. This may consist of general rest in bed or rest for only one member such as an arm or leg which may be kept quiet and not used. In addition to rest, elevation is also useful in combating inflammation and for this purpose the part may be elevated on a chair or a pillow.

In addition to rest, local applications are of great benefit.

Heat and cold are both of use in combating inflammation. An ice bag over a part will very often reduce inflammation, especially if it is the result of an acute injury such as a bruise or a broken bone.

Hot applications are of more value in cases where the inflammation is due to the action of bacteria or their poisons. Heat may be applied either in the form of dry heat, such as the hot water bag or it may be applied as moist heat in the form of hot baths or hot wet dressings.

Local applications of liniments and ointments are also useful in allaying inflammation.

Pain

Pain is nature's method of calling attention to the fact that there is something wrong with a part of the body.

On this account pain is most valuable, since without it the individual might continue to use an injured or sick member, and do irreparable damage before it was discovered.

Not all persons react to pain in the same way. Some pay comparatively little attention to conditions which to others would be almost unbearable.

There are many kinds of pain—sharp, stabbing, dull, continuous, cramping, aching, etc., but regardless of the type, all pain is the signal given by nature to indicate the necessity of immobility and rest for an injured part.

Treatment.—In treating pain the first indication is to secure absolute rest and lack of motion in the part affected.

Local applications of heat or cold, ointments or other medicines to the affected part are also indicated and often bring relief.

Very severe pain in itself may cause damage to the individual, if not relieved. On this account, after other measures have been thoroughly tried and failed, it may be necessary to use opium or morphin to control pain. All other measures should be exhausted before either are used.

Headache

Headache is one of the more common forms of pain requiring treatment. Usually it is an indication of some poison in the system, and frequently is due to poor bowel action. It may however be the sign of the beginning of one of the acute infectious diseases since many of them begin with a headache. Very severe headaches also occur in kidney disease, and when due to that cause, usually continue day after day over a long period of time. Another common cause of headache is eye strain, in which case it can usually be relieved by properly fitted glasses.

Treatment.—The treatment of headache is:

1. A thorough cleaning out of the bowels by means of a cathartic.

2. Five or ten grains of aspirin, which may be repeated in one hour if the headache is not relieved by the first dose.

3. Applications of cold (ice or cold cloths) to the head, especially if the headache is caused by fever.

4. If the headache is persistent over a considerable period of time, a doctor should be consulted at the first opportunity.

Earache

Earache is an extremely painful condition which sometimes follows a severe cold in the head. It is usually due to inflammation occurring in the ear behind the drum. Occasionally

this inflammatory process extends into the bone behind the ear with the development of an abscess in the bone (mastoid disease).

Treatment.—Hot dry applications externally over the ear sometimes give relief.

A small amount (4 or 5 drops) of warm sweet oil or glycerine dropped into the ear with a medicine dropper will often relieve the pain. After using the drops, the ear should be loosely packed with cotton. Still better than plain oil or glycerine is a mixture prepared by adding 10 drops of pure carbolic acid to one ounce of either oil or glycerine and shaking thoroughly in order to dissolve the acid. This mixture should be heated as warm as can be borne before use.

Sometimes pus forms behind the ear drum and the pain is only relieved when the drum bursts and the pus is discharged. When this occurs the ear should be gently washed out twice a day, using a clean syringe and warm sterile boracic acid solution. After washing out the ear it should be loosely packed with cotton.

In case mastoid disease develops, every effort should be made to secure the services of a physician as soon as possible.

Toothache

Toothache is usually due to exposure of the nerve due to decay or to pressure of pus on the nerve of a decayed tooth. The treatment outlined here is only for the purpose of temporary relief.

Treatment.—Any substance which will deaden the exposed nerve will relieve the ordinary toothache. For this purpose a very small ball of cotton saturated with oil of cloves and packed into the cavity of the tooth will usually give relief. If possible clean out the cavity before inserting the oil. If oil of cloves is not available use pure carbolic acid in place of it, being careful not to spill any of the acid in the mouth.

In case there is pus at the root of a tooth or an abscess forms, it must be gotten rid of either by pulling the tooth

or by lancing the abscess. A dentist should be consulted at the first opportunity.

Chest Pain (Pleurisy)

Pain in the chest is more frequently due to pleurisy than to any other cause. By pleurisy is meant an inflammation of the membrane which covers the lungs and lines the inside of the chest cavity. It often follows or accompanies a severe cold, and is sometimes the forewarning of pneumonia or tuberculosis.

It usually comes on suddenly as a sudden severe stitch in the side. When acute it is extremely painful for the patient to take a breath and any movement involving the chest increases the pain. Often considerable fever accompanies the condition.

Treatment.—The treatment consists of:

1. Prevention of movement of the chest wall. This is best accomplished by strapping the chest as shown in Fig. 28 under "Method of strapping broken ribs." The procedure in either case is the same.
2. Rest in bed.
3. Hot dry applications to the affected side.
4. A small dose of morphine during the first stages, if the pain is extremely severe.

Backache

Backache may result from strain due to heavy lifting; from old venereal disease (gonorrhea) which sometimes affects the spine; from an approaching attack of some infectious disease, such as smallpox, which is usually preceded for two or three days by severe backache and headache; or it may be lumbago, which is a very painful condition similar to rheumatism involving the muscles of the back.

Treatment.—The treatment consists of:

1. Hot applications to the back followed by a thorough rubbing with liniment, or, better still, a dry piece of flannel

laid over the back and thoroughly ironed with a hot flat iron, will often give relief.

2. Aspirin, 10 grains every three or four hours.

3. A cathartic.

Cramps and Bellyache

Cramps and colic are usually due to indigestible or poisonous substances in the intestine, although abdominal pain is one of the common symptoms in such diseases as appendicitis, cholera, typhoid fever and dysentery. It is often accompanied by vomiting and diarrhea.

Treatment.—The treatment is:

1. A thorough cleaning out of the bowel by means of castor oil, which will quickly get rid of poisonous or indigestible substances.

2. Small amounts of hot drinks by mouth.

3. A thorough washing out of the bowel by means of an injection of soapy water.

4. Hot applications over the abdomen.

5. If the pain is not relieved by the above measures, one or two teaspoonfuls of paregoric may be given in a little water. This may be repeated in one hour if the patient is not relieved.

6. Should the pain be extremely severe and the patient not be relieved by the above measures, it may be necessary to use morphine. (Exhaust all other measures first before giving it.)

As cathartics should never be given in cases of appendicitis, if there is any suspicion that the patient has this disease, do not give a cathartic. (See paragraph on appendicitis.)

Diarrhea

Diarrhea, except when due to an acute infectious disease, is nature's method of getting rid of putrefying or unwholesome matter in the intestines.

Treatment.—The treatment is:

1. A thorough cleaning out by means of castor oil which

will rapidly work off all the irritating substances in the bowel.

2. Doses of one-quarter to one-half level teaspoonful of bismuth powder every 4 hours.

3. Small doses of paregoric, one to two teaspoonfuls every 4 hours, if necessary, to stop cramping after the cathartic has accomplished its work.

4. Very light or fluid diet for 2 or 3 days.

5. If the diarrhea is severe rest in bed is indicated.

Painful Joints and Muscles (Rheumatism)

Rheumatism is usually due to the growth of germs in or about the affected joints or muscles. The swelling which occurs about a rheumatic joint is a protective process as it tends to pull the bones apart and in that way stop pain. Rheumatism may be due to any of a number of causes. One of the more common is gonorrhea. Also absorption of pus into the system from bad teeth or from infected tonsils may cause the condition.

Treatment.—The temporary treatment of painful and swollen joints and muscles consists in:

1. Rest of the affected part.

2. Thorough rubbing with liniment.

3. Bandaging the part with warm flannel.

4. Aspirin in doses of from 10 to 20 grains every 4 hours.

5. A thorough cleansing out of the bowels.

When rheumatism is due to gonorrhea, aspirin does little good except to temporarily relieve pain. After an attack of rheumatism a doctor should be consulted as soon as possible. He may be able to find the cause of the disease and prevent another attack.

Nausea and Vomiting

Like many of the symptoms which we have studied, nausea and vomiting may indicate the beginning of some acute infectious disease or may be due merely to an upset stomach or

the presence of indigestible or poisonous substances in the stomach or intestine. Sea-sickness should also be kept in mind.

When due to either of the latter causes, vomiting is a protective process and is the method nature has of getting rid of offending stomach contents. After the stomach has been emptied, however, retching and efforts to vomit may at times so exhaust the individual as to endanger his life.

Treatment.—

1. The patient should lie down and keep as quiet as possible.

2. All foods should be stopped.

3. Give small amounts of either very cold water or small pieces of cracked ice which should be swallowed. Occasionally very hot fluids are better than cold to stop vomiting. Sips of very hot clear tea or coffee sometimes are effective.

4. A thorough evacuation of the bowels is usually indicated. For this purpose, use small doses of powdered calomel, ½ grain, repeated. (See Calomel.)

Fainting

Like many other symptoms, fainting may be merely a temporary affair of little significance or, it may indicate some more grave disease. It often amounts to only a temporary muscular weakness, an "all gone" feeling, though in other cases the patient may entirely lose consciousness.

An attack of fainting often follows some nervous strain or some unpleasant sight or sensation such as the sight of blood.

When an individual faints, his face grows pale, the pupils of his eyes dilate, there is an increasing muscular weakness and he usually falls unconscious. Just before consciousness is lost there may be some convulsive twitching of the arms and legs. Usually the attack lasts for only a very short time, at most 3 or 4 minutes.

Treatment.—

1. Let the individual lie down flat. If possible the head should be lower than the feet.

2. Loosen the clothing, especially that about the neck.

3. Apply cold water or ice to the head and back of the neck.

4. If it is available, a cloth with a little ammonia water on it held to the nostrils may hurry recovery.

Do not attempt to give the patient anything by mouth while he is unconscious.

Delirium

Delirium is a temporary mental derangement which may occur as a result of fever, poisons or the excessive use of alcohol. When due to alcohol it is known as "delirium tremens." Delirium is also a symptom in certain forms of insanity.

A patient with delirium is unable to think clearly, he often sees things and hears noises which do not exist, and is usually unable to speak clearly or connectedly. He may become excited and violent though in his violence he is more likely to harm himself than others. On this account, he must be closely watched.

Delirium is fairly common in fever. It is not necessarily a serious symptom. Often the harm resulting from this condition is due to exhaustion from the excessive activity of the patient. It is more common at night.

Treatment.—A delirious patient must be watched constantly as he may jump overboard or seriously injure himself if left alone. It may be necessary to restrain him by tying him in bed with sheets.

If the delirium is due to fever it usually subsides with the subsidence of the fever, and when due to this cause, treatment of fever plus watching is all that is necessary.

In violent delirium, especially that due to the excessive

use of alcohol, restraint is, of course, necessary and may be accomplished by locking the individual in a bare room or by tying him in bed, always maintaining a watch over him in order to prevent his injuring himself.

A thorough bowel movement is desirable in these cases and may be accomplished by giving the patient calomel, salts or castor oil. If the delirium is due to excessive drinking, it is usually advisable to continue to give small amounts of alcohol at intervals (½ ounce of pure grain alcohol diluted at least with an equal quantity of water every 2 or 3 hours).

Should the patient become exhausted and his pulse fail, strychnine and hot black coffee may be used as stimulants.

Convulsions (Fits)

The most common cause of "fits" in adults is epilepsy, though occasionally similar attacks occur in poisoning from certain drugs and from kidney disease.

No epileptic should be shipped. If one is found among the crew, he should be paid off at the first opportunity.

At the beginning of an epileptic attack (fit) the patient often emits a loud scream and then falls unconscious. Usually the head is drawn back, the fists clenched, the arms drawn up and the face turns a livid bluish color. After a few seconds a spasm of all the muscles begins and the arms, legs, head and jaws jerk so violently that the whole body may be tossed about on the deck. During the spasm the tongue may be caught between the teeth and badly bitten. Usually the patient froths at the mouth, and the froth may be stained with blood. Stool and urine may be passed involuntarily.

After one or two minutes the spasms stop and the color of the skin improves. Following this the patient usually falls into a deep sound sleep which may last several hours.

Treatment.—Keep the patient from injuring himself which he may do by falling down companionways or hatches or by thrashing about against things. Stuff the end of a folded

towel, a piece of wood or a bit of rope between his teeth to keep him from biting his tongue. Do not put fingers in mouth or they may be badly bitten.

Sign him off as soon as possible. If he has had one attack he will probably have more.

Apoplexy—Paralysis

As men grow older their arteries become hard. Certain diseases, notably syphilis which has not been properly treated, may also cause hardening of the arteries. As a result of this one of the vessels may burst and cause a hemorrhage in the brain.

When this occurs the individual usually loses consciousness immediately. He may die at once or may remain unconscious for days. Should he recover consciousness he will usually be found to be paralyzed on one side of the body. This is often accompanied by difficulty of speech and of swallowing due to the paralysis of the tongue.

Treatment.—Put the patient into bed at once with the head and upper part of the body elevated on pillows and keep him quiet.

Give a big dose of salts if he is able to swallow.

Light foods only should be given.

Attend to the bowels and bladder. It is often necessary to catheterize a paralyzed man.

Turn him over to a doctor as soon as possible.

Insanity

Occasionally insanity develops on board ship or an insane individual may be signed on, as it is not always easy to recognize insanity without prolonged observation.

If the actions of a person become so peculiar that he can not get along with others or he creates a disturbance, it may be necessary to restrain him in some way.

In handling the insane, even in forcibly restraining them, avoid unnecessary roughness and cruelty. Remember that they are not responsible for their condition or their actions. They are seldom dangerous.

Treatment.—Keep them from injuring themselves or others by restraining them in a strong room or by holding them under guard.

See that they get sufficient food and water.

Give them general care as they will not look out for themselves.

As soon as possible turn them over to the proper authorities for treatment.

Skin Rashes—Isolation

Skin rashes are often one of the signs of a contagious disease and some of them are quarantinable. Consequently the skin of the sick should be observed carefully each day for a "breaking out."

Any patient who develops a skin rash, especially if he also has fever, should be isolated.

One man of the crew should be assigned to look after him. This man should wear a gown when attending the patient and should carefully wash his hands after each visit to him.

Whenever there is doubt as to whether a man is suffering from a communicable disease, isolate him. It is easier to prevent new cases than to care for others who may "catch" the disease. In addition it may save trouble when the ship arrives at quarantine.

PART VIII

SPECIFIC MEDICAL DISEASES AND THEIR TREATMENT

Typhoid Fever

Typhoid fever is an acute, infectious disease which is caused by drinking water containing typhoid germs or by taking into the mouth substances containing these germs. Typhoid germs always come from the intestine of some one who is or has been ill with this disease. Typhoid is characterized by a severe, prolonged illness and results in death in about 10 per cent. of persons having the disease. It frequently begins with a headache, sleepiness, etc., for a period of a week or more before the actual onset of the fever. The fever is high and continuous, remaining with very little variation at about 103 to 104 degrees, morning and evening, for three to five weeks, then drops slowly, leaving the patient in an extremely weakened condition. During the early stage of the fever, the appetite is lost and the patient has no desire for food through practically the whole course of the disease. The mouth, due to the fever, gets in an extremely bad condition, the tongue and teeth being covered by a thick gummy material which is difficult to remove. Very often, the patient becomes delirious or goes into a stupor. During practically the whole course of the disease, the stools are of a yellowish, green character, very thin, slimy and very offensive. One of the complications of the disease which is most feared is bleeding into the bowel. This blood may be bright red if fresh, or black in color if it is older. Dur-

ing the early stage of the disease, there is a breaking out over the belly and chest, consisting of very small, reddish points, usually about a dozen in number, which disappear on pressure.

Treatment.—The treatment of the disease consists in putting the patient to bed and keeping him there as nearly as possible on fluid diet. He may be given all the water he desires, milk (malted or fresh), strained soups and other similar fluid foods. Nourishment should be given in small amounts, frequently repeated (every two or three hours). For the fever, cool baths are best, and tend to reduce the temperature and make the patient feel better. No medicine is necessary, except possibly a preliminary dose of castor oil, nor does medicine do any particular good. The directions for the general care of fevers should be followed. To prevent others developing the disease, clothes, eating or drinking utensils or other things of this type, used by the patient, must be sterilized by boiling. The stools and urine should be disinfected by adding chloride of lime or mixing equal parts of stool and 2 per cent. solution of cresol or 5 per cent. solution of carbolic acid, letting them stand for an hour, by which time they will be disinfected and will do no harm if thrown overboard. Even after the appetite returns, which is at the end of about five to seven weeks, it is best to keep the patient on very soft diet for at least two or three weeks longer, as there is danger of rupturing the bowel if heavy foods are taken.

Malaria

Malaria is a disease caused by a tiny animal which gets into the blood, through the bite of the Anopheles mosquito, and which develops there, giving rise to thousands of similar animals. These cause the chills, fever and sweats which follow one another in regular order and which is the typical picture of this disease. An attack of malaria may be sudden or may be preceded by headache and sometimes by vomiting. It usually starts with a chill which may be of any degree of

severity; sometimes only a chilly feeling. Usually, however, the chill is well marked, the teeth chatter and the whole body shakes. The chill may last from a few minutes to an hour. As the chill subsides, it is succeeded by the hot stage. The face becomes flushed, the pulse full and pounding, the head aches and the patient has a high fever. This stage lasts from a half hour to four or five hours, when a sweat occurs, with the gradual disappearance of the fever, headache and other symptoms. Following this, the patient usually falls into a refreshing sleep. The sweating stage ordinarily lasts from one to three hours. At the end of the sweating stage, the patient may feel quite fatigued or may feel well and able to be up and about until the beginning of the next attack, at the end of 24, 48 or 72 hours.

Pernicious malarial fever is a very fatal disease which occurs chiefly in hot climates. The patient may be taken suddenly with headache, high fever, and delirium, and may rapidly pass into unconsciousness. Death may occur within a few hours of the beginning of the attack. In severe malaria, hemorrhages from the gums and mucous membranes sometimes occur, even the urine sometimes containing blood.

Treatment.—The treatment of malaria consists in giving quinine. Quinine should be given in acute malaria in doses of ten or fifteen grains by mouth three times a day, and, as the symptoms grow less, this dose is reduced to ten grains once a day. Malaria can be prevented by taking quinine. (See Prevention of Malaria, page 20.)

The headache in malaria may be relieved by cold applications. In cases of collapse, hot stimulating drinks should be given. For extreme pain or restlessness, one or two teaspoonfuls of paregoric should be given. Free purgation should be maintained during the treatment of malaria. If there is much vomiting, and the quinine cannot be retained on the stomach, it may be given by rectum, by first washing out the rectum and then injecting into the rectum forty or fifty grains of quinine in two ounces of water. Quinine is the remedy for

any form of malaria fever. If the fever does not yield to quinine, it is safe to assume that it is not malaria.

Frequently, men who have had malaria and who come from a hot climate into a temperate or cold climate, have an attack of chills and fever. In this case, they should immediately take quinine, just as in an acute attack of the disease.

Typhus Fever

(Ship Fever; Prison Fever)

Typhus fever is an acute, infectious disease which is transmitted by the bite of the louse. The prevention of this disease depends upon the eradication of lice from the clothes and from the body. (See method of getting rid of vermin, page 7.) In attending a typhus patient, particular care should be taken not to become infested with lice. The incubation period of the disease is from five to fifteen days. It usually begins suddenly with chills, fever, headache, pain in legs, mental dullness and vomiting. There is a breaking out which appears within two or three days. This eruption consists of a pale reddish rash under the skin. The fever usually is about 102 or 103 and lasts from two to three weeks.

Treatment.—The treatment consists of that for the general care of all fever patients, plus extra care to prevent spreading of the disease by lice from the patient to others.

Bubonic Plague

Bubonic plague is a disease which is so named because of the fact that one of its chief symptoms is the formation of buboes or swelling of the glands, usually in the arm pits or groins. The disease follows the bite of the rat flea which may carry plague germs in its body and in biting inject them into the human body.

There are two other forms of plague, one known as septicemic plague, which is practically always fatal and in which

the patient dies before buboes have time to develop; and another type, known as the pneumonic plague or plague pneumonia. Plague pneumonia is practically always fatal.

In bubonic plague, buboes develop in about 75 per cent. of all the cases. These are chiefly in the groins but also occur in the arm pit and neck. The swellings vary in size from a marble to a goose egg and are as a rule very painful, being very much more painful than a bubo due to venereal disease. The germs causing the disease are found in the buboes and blood of the patient, and in addition to being injected by a flea bite, may enter the body through small cuts or injuries to the skin. Plague is practically always carried by rats, and in most epidemics, plague is preceded by wholesale deaths among the rats.

Symptoms.—The incubation period of plague is two to five days. Most cases of bubonic plague begin suddenly with fever which may or may not be preceded by a chill. The temperature rises rapidly to 105 or 106 degrees on the second or third day. The pulse at first, full and bounding, soon becomes weak, the beats varying from 100 to 150 or more per minute. The tongue becomes dry and brown in color, and delirium or unconsciousness may set in. The patient is usually exceedingly ill and may die in this early stage, before the buboes develop. Most cases of plague that die, die within the first six days. In those cases of plague which do recover, there is a very slow but very gradual improvement. At the site of the bubo, there is usually left an indolent sore which is very slow to heal.

Treatment.—Should plague develop, the patient should be immediately separated from the rest of the crew and placed in a clean well ventilated compartment. Articles of clothing or bedding soiled by the discharges of the patient should be burned, disinfected by steam or by boiling. All rats and vermin of every kind should as far as possible be destroyed. Discharges from the patient, urine, stool, vomit or sputum, should be passed into a solution of cresol, carbolic acid, or chloride of lime and allowed to stand until disinfected. All

articles brought into contact with the patient should be disinfected. A preliminary cathartic should be given when the patient is first taken ill. Stimulants, i.e., hot coffee or strychnine sulphate, grain $\frac{1}{30}$, should be given every three or four hours from the beginning. Ice or cold water should be applied to the head to relieve the aching. To reduce the temperature, the body may be sponged with cold or tepid water. After the buboes soften, they should be cut open and dressed. Pain and restlessness may be relieved by paregoric, two or three teaspoonfuls, by mouth or by $\frac{1}{4}$ grain of morphine. The ship should be taken to the nearest quarantine station for thorough fumigation in order to kill all rats.

Cholera

Cholera is an acute, infectious disease, which is caused by the swallowing of a germ called the cholera germ. This disease is transmitted from person to person through contamination of drinking water or food with the germs of cholera, from some one sick with this disease. The presence of cholera means that food or drinking water have been used which contained the germs of cholera, discharged in the stool of a patient having this disease. Since the disease is transmitted in this way, exceptional care should be taken during the existence of cholera thoroughly to disinfect by cooking, all foods, and to drink only water that has been boiled. The hands of those coming in contact with cholera patients should be carefully washed after handling the patient, since they may become soiled with his discharges. The clothing of the attendant should be covered by a gown or other cover which can be disinfected if soiled.

Cholera has an incubation period of from two to five days. The disease may be of any degree of severity, sometimes consisting of only a rather severe diarrhea with colicky pains, purging and vomiting, or it may be an extremely severe condition. In most cases, cholera begins with a looseness of the bowels or

a simple diarrhea, which becomes more violent in the severe cases within an hour, or others within a day. The stools soon lose their yellowish color and appear grayish white. From their appearance they are known as "rice water stools," and are typical of the disease. The diarrhea is accompanied by vomiting. There is a burning sensation in the stomach and an unquenchable thirst. Severe cramps occur in the feet and calves of the legs and sometimes in the hands and arms. There is usually no excretion of urine, as the fluids of the body all flow into the stomach and bowel and large amounts of fluids may gush from the mouth as well as from the rectum. The skin becomes cold and clammy and covered with sweat and the patient extremely weak. The tongue is heavily coated and cold to the touch and the patient sinks into a condition of collapse. During this time, the temperature may fall to five or six degrees below normal. The mind usually remains clear until near the end.

In the most severe forms of cholera, the patient may go into collapse within an hour of the beginning of the attack. In the milder form in which the patient survives the collapse, the symptoms gradually subside, the skin becomes warmer, the pulse stronger, the urine is again passed, the stools become more natural, and eventually, the patient recovers.

Treatment.—During the prevalence of cholera, or while in a port where cholera is occurring, all cases of diarrhea or irritable stomach should receive careful attention, as cholera usually begins with such symptoms. Rest in bed, fluid diet and clean surroundings must be insisted upon. The drinking water for all hands must be boiled. The patient should be carefully isolated and everything coming into contact with him or soiled by his discharges must be disinfected. The stools should be passed into a vessel and a 5 per cent. solution of carbolic acid or a 10 per cent. solution of chloride of lime added in equal volume and allowed to stand one hour. All linen and bed clothes should be disinfected by steam or by boiling. Spoons, knives, plates and similar utensils should be boiled

immediately after use. The medical treatment consists in giving paregoric or morphine to check the cramps and diarrhea. During the stage of collapse, small amounts of alcohol and water, hot coffee and tea are valuable. Warm water should also be injected into the rectum very slowly from a long, soft rubber tube attached to a fountain syringe. This water is retained and absorbed. The patient should be wrapped in warm blankets and stimulated and supported in every way. As the symptoms subside, the food may gradually be increased, relying largely on fluids for the first few days. A ship on which cholera breaks out should, of course, go to the nearest quarantine station for treatment of the sick and thorough sterilization of water supplies, etc., in order that the disease may be checked.

Yellow Fever

Yellow fever is an acute, infectious disease, which occurs in warm climates. It is characterized by fever, yellowness of the skin and whites of the eyes, suppression of the urine, and bloody or black vomit. This disease is carried from person to person by the bite of a certain kind of mosquito known as the *Stegomyia fasciata*. So far as is known, the disease is transmitted in no other way except by the bite of this mosquito which has fed on some one sick with the disease. This disease is not carried by the discharges, or by articles which have come in contact with a patient ill with the disease, consequently, it is unnecessary to disinfect them. The only measure necessary to stop the spread of yellow fever is the destruction of mosquitoes, which can be accomplished by fumigation with sulphur or cyanide. Of equal importance, where it is impossible to destroy mosquitoes, is the protection of the person ill with the disease, from mosquitoes, in order that the mosquito may not bite this ill person and then carry the disease to some one else.

The incubation period of yellow fever is from two to five days. The disease begins suddenly, and usually, though not

always, with a chill. The chill is followed by a moderate or high fever, 101 to 105 degrees, with a hot skin and rapid pulse (pulse about 100 to 120 per minute), flushed face and watery; red eyes. The tongue in the early stage of the disease is usually moist and coated but later becomes dry. There is a marked thirst, a sore throat and an irritable stomach, and, in most cases nausea and vomiting which begin early. The bowels are usually constipated, and the stools a dark color. The urine is very scant. The fever, during this first stage, may last from two to three days. During all the time the fever keeps up, the pulse grows steadily slower. Death may take place during the first two or three days of the disease.

Usually, this first fever stage is followed by a second stage of calm, during which time the fever goes down and the symptoms subside. During this stage, there is usually yellowness of the eyes. In the milder cases, this is the beginning of recovery.

In the more severe cases, there is a third stage during which the temperature again rises. All the symptoms of the first stage recur with increased severity. The jaundice or yellowness of the skin and eyes increases. The vomiting increases. The vomited matter may contain blood, and then looks like coffee grounds. The patient complains of severe abdominal pains or cramps. The stools may be black and tarry. The urine is very scant. It is said that where black vomit sets in early, the disease is nearly always fatal.

Treatment.—If illness which is believed to be yellow fever appears after having visited a yellow fever port, the patient should be immediately isolated in a well screened, clean room and should be supplied with an attendant or nurse who has had the disease, if possible. A cathartic should be given early in the disease, perferably three to five grains of calomel, which should be followed some hours later by salts. For the vomiting, small pieces of ice in the patient's mouth and sips of cold fluids will aid materially. The bowels should be kept open, if necessary, by means of rectal injections of soapy water. For

the high fever and restlessness, give five to ten grains of aspirin. The most important factors in the treatment of yellow fever are careful nursing, general care, and the diet. The diet should consist only of fluids of the thinnest and most easily digested character.

The chief problem is the destruction of mosquitoes in order that the disease may not be carried from one member of the crew to another. (See Prevention of Yellow Fever, page 19.)

Smallpox

Smallpox is an infectious disease characterized by fever and a typical eruption on the body. This disease spreads rapidly among persons not protected by vaccination, and is carried, so far as is known, by direct contact with the sick individual, or by the clothing or articles that have been in contact with him. It is extremely contagious during practically its whole course. The incubation period is from eight to fourteen days. The disease begins usually rather suddenly with a chill, a severe pain in the back, an intense headache, and a high fever. The eruption appears about the third or fourth day after the beginning of the backache, headache, etc., and appears as hard pimples very firm to the touch, bright red in color, usually beginning on the forehead, wrists and about the lips. This first eruption is called the papular stage and each spot feels very much like a shot under the skin. As soon as the eruption breaks out, the temperature begins to fall and the patient feels very much better. On about the fifth or sixth day, a small blister filled with straw colored fluid appears on the top of each papule. Each blister or vesicle, as it is called, has a depression in the center, which is characteristic of the eruption of smallpox. In about eight or nine days, the fluid in these blisters changes to pus. At this time, each spot is known as a pustule. Each pustule has a yellowish gray appearance and is surrounded by a red area. The skin between them becomes swollen and the eyes may be swollen shut. At this time, the temperature rises again and the patient becomes very ill.

After a day or two, the pustules break and crusts form, first on the face and then over other parts of the body. The crusts dry and fall off, leaving red spots on the skin with here and there a characteristic pit or pockmark. In a very severe form of smallpox, known as confluent smallpox, the eruption appears very much closer together, the swelling is more marked and the features are distorted. Severe delirium and death may occur on the ninth or tenth day or even earlier. Another still more severe form of smallpox is known as bloody smallpox. In this form, in place of having the characteristic eruption, blood blisters appear under the skin, there is bleeding from the nose, mouth and rectum, and the patient usually dies before there is a typical eruption and pustule formation.

Where crusts form, they begin to drop off about the fourteenth or fifteenth day, but this process is not complete until about the end of the fourth week, and during all this time, the disease is "catching." A very much milder form of smallpox occasionally occurs among those who have been vaccinated.

Treatment.—The patient should be placed in a cool, well ventilated room and strictly isolated. The attendant in care of the patient should be one who has had smallpox or is known to have had a recent successful vaccination. He should wear either a gown or some form of clothing which can be easily disinfected or can be destroyed afterward. The attendant should not be allowed to come in contact with other members of the crew. Separate dishes and utensils should be provided. The soiled clothing, etc., from the sick room should be either burned or thoroughly boiled or soaked for one hour or more in 1:1000 bichloride solution.

In the early stages of the disease, a cool sponge bath every three hours will relieve the patient somewhat if the temperature is high. A cathartic may be necessary. For the severe pain in the back and head, a morphine tablet, ¼ grain, by mouth, may be given and if necessary repeated in four hours. The food should be soft or fluid and given at regular intervals. Fluid, water, etc., should be given very freely.

Cold applications to the skin will relieve the pain and burning. When pus begins to form in the blisters, the top of each blister should be touched with a little tincture of iodine. After this, each pustule may be punctured by a sterilized needle. The hair should be cut short early in the disease, and when crusts begin to form, olive oil or vaseline should be applied to soften them. The eyes must be carefully cleaned with boric acid solution several times a day and the mouth and throat should be washed with alkaline antiseptic solution. The crusts, scabs, etc., should be carefully burned when they fall off and the patient should have a careful daily bath as soon as these crusts have fallen off. Following the completion of a case of smallpox, every article in the room, including the room itself must be carefully disinfected by burning sulphur, five pounds to every 1000 cubic feet of air space, followed by a thorough, prolonged airing. If anyone on board breaks out with smallpox, the ship should be immediately taken to the nearest quarantine station.

Of greater importance than the treatment of the disease, is the prevention of smallpox. Smallpox can practically always be prevented by thorough vaccination. Even after the disease breaks out, if vaccination is immediately carried out on all individuals, smallpox will not spread. (For method of vaccination, see page 21.)

Pneumonia

Pneumonia, or inflammation of the lungs, is an acute infectious disease which is likely to follow prolonged exposure, injury to the chest, or reduction in vitality, if the individual is exposed to the disease or carries germs of the disease in his nose or throat. It is very mildly "catching." It is a highly fatal disease for which very little can be done in a medical way, except the general care given all fevers. The disease may begin as an ordinary cold which extends into the lungs or it may have a sudden onset, beginning with a very sharp pain in the chest, and with rapidly increasing fever, the temperature

mounting rapidly to 103 or 104. The sputum in the early stages of the disease usually contains some bright blood, which later changes to a rust color and gives the characteristic appearance of pneumonia sputum, so called "prune juice sputum." The fever is usually continuous for from five days to two weeks. There is sometimes delirium from this fever. The breath is usually taken in short, sharp gasps (from 40 to 60 to the minute). Each breath is commonly accompanied by a short cough or grunt. The great danger in pneumonia is failure of the heart. When the fever ends, it usually ends abruptly, falling to normal within twelve hours, although the patient will be weak and ill for several days after the temperature drops.

Treatment.—The treatment in pneumonia consists in keeping the patient in bed in a cool, well ventilated place, with careful nursing, and plenty of light, nutritious food. Small doses of cough mixture may be given to relieve the cough. For the severe pain in the chest, especially in the beginning of the disease, a small dose of morphine by mouth is necessary. In case of heart failure, as shown by rapid weakened pulse, strychnine should be given either by mouth or hypodermically. Hot coffee or tea, which contain the stimulant caffein, are also valuable. Pneumonia frequently leaves the heart considerably weakened, so that the patient may be unable to do heavy work for several weeks after he is able to be up and about.

Influenza

Influenza is an acute, infectious disease which usually starts like a severe cold. It is a respiratory disease and is transmitted from one to another by the breath and by discharges from the nose and throat. The patient often becomes very ill in a few hours, with a fever, rapid pulse and often severe chills. He usually feels much more ill than his fever, pulse, etc., would indicate. The most feared complication in influenza, is the development of pneumonia, which is rapidly fatal in a large

proportion of cases. The disease lasts usually from three days to a week, although with true influenza, the patient feels ill and weak for a very considerable period of time after this.

Treatment.—The treatment of this condition, as of all fevers, is to put the patient to bed and keep him there on a light diet. A cathartic should be given in the early stage, if necessary, to move the bowels thoroughly. Medicines do very little, if any good. Small doses of aspirin, five to ten grains, relieve the pain and aching which accompanies this disease. Influenza patients should be isolated from the rest of the crew and the discharges, especially from the nose and throat, be carefully disinfected.

Tuberculosis

Tuberculosis is a disease which, if discovered and treated early enough, can nearly always be cured; if neglected until far advanced, the individual nearly always dies. On this account, periodic examination of the lungs is advisable and will be gladly done at any Marine Hospital or Relief Station of the U. S. Public Health Service.

In the beginning of the disease, there is usually a slight loss of weight, together with a little fever, especially late in the afternoon. There may or may not be during the early stages of the disease, a slight hacking cough, which continues week after week. Often, there is considerable sputum coughed up from the lungs which may contain blood streaks. The fever is usually not high, rarely going above 102 in the afternoon, and falling to near normal in the morning. There is a progressive loss in weight. At any stage of the disease, there may be a hemorrhage from the lungs.

Treatment.—Very little medical treatment can be carried out aboard ship. The disease is chronic in nature, so that it is usually possible to get the patient to port and to a hospital in sufficient time for treatment. In the meantime, in a known case of tuberculosis, keep the patient in bed and feed him as

liberally as possible with as nourishing food as can be secured. In case hemorrhage occurs put him to bed and keep him absolutely quiet, give small pieces of cracked ice which should be swallowed and, in addition, give morphine, ¼ grain, by hypodermic. This will usually control the bleeding.

Dysentery

Dysentery or, as it is sometimes called, bloody flux, consists of a severe inflammation of the mucous membrane lining the bowel. There are two varieties, both occurring more commonly in tropical and semi-tropical countries. The most common of these forms is amebic dysentery, which is caused by a tiny animal which is taken into the system with drinking water or in food.

Symptoms.—The disease begins very much like ordinary diarrhea, with possibly a slight chill and fever. After a day or two, the diarrheal stool is replaced by a stool consisting largely of mucus, which may be mixed with blood. The diarrhea is accompanied by a constant desire to move the bowels and more or less cramp and colic. The stools may number from ten to thirty in a day, though the quantity of each stool is very small. In amebic dysentery, abscess of the liver is a common complication.

Treatment.—A patient with dysentery should be put to bed and given a thorough cleaning out by means of castor oil. Following this, it will probably be necessary to give either morphine or paregoric to stop the cramping. Ipecac, which is carried in the medicine chest, is almost a specific for amebic diarrhea. Ipecac (Alcresta) should be given in doses of 10 to 15 grains, three times a day. The food should consist largely of fluids and of the most easily digested substances in order to prevent further irritation of the bowel. As soon as possible, the patient should be taken to port and to a physician, as more vigorous treatment than this is needed to do away with the infection.

Erysipelas

Erysipelas is an acute inflammation of the skin. It usually begins on the face, more commonly over the bridge of the nose, as a small red spot rapidly growing in size until it spreads over the whole of the face, ears and scalp, and occasionally down the back and chest. The skin is painful, red, hot and swollen. Blisters frequently form. The eyes usually swell shut. The patient's face is so distorted as to be unrecognizable. The disease runs its course in from a few days to a week. Frequently, in those individuals addicted to alcohol, delirium develops. Erysipelas is contagious only in that it may be the cause of infection in a wound or scratch on the body of a person caring for a patient having this disease.

Treatment.—The disease runs its course uninfluenced by treatment. Cold water as an application is probably as good as anything that can be used, as it brings marked relief to the swollen and burning skin. Cloths saturated with cold water should be placed over the inflamed areas and changed frequently. A thorough cleaning out of the bowels is indicated. The disease runs its course usually in about a week.

Tonsillitis

Tonsillitis is an acute, sore throat and is a very common condition. It often follows exposure to wet and cold. The tonsils, and very often the whole of the throat, become covered by whitish-yellow patches. This inflammation is often accompanied by a high fever and chills. Frequently, an abscess develops beneath the tonsil which, if not opened by means of a knife, goes on to rupture.

Treatment.—The treatment consists in the use of a gargle of ordinary baking soda, one teaspoonful to the glass. Cold applications to the throat will relieve the pain. The treatment should be started by a thorough cleaning out of the bowel. Persons subject to attacks of tonsillitis should have their tonsils removed by a physician at the earliest opportunity.

Venereal Disease

There are three ordinary forms of venereal disease:—*Gonorrhea,* or clap; *syphilis,* great pox or chancre; and *chancroid,* or soft chancre. These diseases are usually contracted through sexual intercourse.

Gonorrhea

Gonorrhea consists of an acute inflammation of the water passage, together with a discharge of pus which begins in from three to seven days after intercourse. In the beginning there is a burning and stinging pain, which occurs on attempting to pass water. This inflammation continues to become more severe up to about the end of the third week. By that time there is often great difficulty in passing water, and a great deal of pain experienced at night from involuntary erections (chordee). Accompanying the inflammation of the water passage, there may be a swelling of the testicles. The chief danger of this disease on shipboard is that the disease may be spread to the eyes of others through soiling of common towels or other articles of this type. A patient having gonorrhea should be cautioned to use none but his own towels and to wash his hands carefully each time his fingers become soiled with the discharge. The disease runs its acute course in from three to six weeks, gradually subsiding and leaving a chronic, very slightly purulent discharge.

Treatment.—The treatment consists in a preliminary cathartic; drinking plenty of water to which a small amount of baking soda should be added for the purpose of making the urine bland; light diet without much spice or pepper; frequent bathing and, during the acute stage of the disease, capsules of copaiba and santol oil, one or two, three times a day. These capsules have no curative effect but will relieve the pain. As the discharge becomes less, injections 1:2000 potassium permanganate solution, three or four times a day tend to dry up the discharge. As soon as possible, the patient should go

to a physician for continuation of his treatment. For the painful erections (chordee) cold applications (either cracked ice or cloths wrung out of cold water). For swollen testicles, rest in bed and a suspensory bandage with a liberal application of ichthyol ointment will relieve the condition.

Syphilis

Syphilis is not a local but is a general constitutional disease, which is usually contracted through sexual intercourse. During the first stage, it usually consists of a single ulcer or chancre, which appears anywhere from ten days to six weeks after exposure. After a varying period of time, from one to six weeks after the appearance of the first sore, there is a general breaking out over the whole body. Sores appear in the mouth, on the lips and tongue, and sore throat is common. The hair frequently falls out and syphilitic warts may appear about the anus, under the arms or in any location where the skin is constantly moist. During this, the second stage, the disease is most dangerous to others, since the use of cups, knives, forks or other utensils of this sort by one having syphilitic sore mouth may cause the development of the disease in some one else who uses these articles. Persons suffering from syphilis should be forced to have and use their own eating and drinking utensils and keep them separate from those of others, as well as to use their own towels, sweat rags, etc.

Treatment.—For the primary sore, the parts should be bathed with soap and water twice a day and dusted with calomel powder. The general treatment of the disease consists of careful rubbing into the skin, once each day, a small amount (piece the size of a small bean) of mercury ointment. During the use of mercury, the teeth and gums must be carefully watched and should be brushed each day with a soft toothbrush and tincture of myrrh. As soon as possible, a physician should be consulted in order that proper treatment may be administered. The treatment of syphilis is not a matter of a

week or a month, but is a matter of months or years, and treatment should not be discontinued until the doctor can find no more symptoms of the disease by ordinary examination or by the blood test and even after being pronounced cured, the patient should have a blood test taken every six months or a year for several years.

Sufferers should be particularly advised that the mere disappearance of symptoms does not mean a cure, and unless the disease is properly treated under a competent doctor, later in life there is very likely to occur serious conditions affecting the blood vessels and internal organs which may result in death. Any seaman suffering from syphilis can secure treatment at any U. S. Marine Hospital or Relief Station and he should be urged to do so.

Chancroid

Chancroid, or soft chancre, is a local ulcer which usually begins within two or three days after exposure. The ulcer is very much more severe than that of syphilis and spreads rapidly, very often causing the formation of three or four more ulcers. It is accompanied by the formation of buboes or abscesses in the glands of the groins. It is difficult to tell whether an ulcer is a hard or soft chancre, and the only safe procedure is to consult a physician as soon as posible. One ulcer may be both a hard and a soft chancre.

Treatment.—The treatment consists of thoroughly washing with soap and water, cauterization at once, by means of a small amount of pure carbolic acid on the end of a probe and dusting with calomel powder. In cauterizing with carbolic acid, be very careful not to spill the acid or to apply it any place other than the surface of the ulcer. A frequent washing (three or four times a day) with 1:2000 bichloride of mercury solution followed by a thorough dusting with calomel powder is very often beneficial. If abscesses form in the groins, it will be necessary to lance them. (See directions under surgical procedure, page 135.)

Itch (or Scabies)

This is a condition produced by a tiny insect which burrows into the skin, particularly between the fingers and toes. The itching from this disease is almost intolerable, and is usually worse at night. The disease is spread by personal contact, by clothing and by bedding.

Treatment.—Sulphur ointment is almost a specific for this disease. The body should be bathed thoroughly with soap and water, the skin dried and the ointment applied. The ointment should be rubbed in well for three successive days without bathing followed by a thorough bath and a complete change of clothes and bedding.

Heat Exhaustion

Heat exhaustion is a condition which must not be confused with sun stroke. It arises from long continued exposure to high temperatures, especially where the ventilation is poor, and may occur occasionally among men working in the stoke hole. The symptoms are fainting and collapse. The pulse becomes very rapid and feeble; the temperature falls below normal; the face becomes pale; the skin cold and clammy in spite of the heat to which the patient is subjected. The treatment consists of wrapping the patient in warm blankets, giving stimulants such as strychnin, tea or coffee, putting him to bed and allowing rest for several days.

Sun Stroke

Sun stroke is an entirely different condition from heat exhaustion. In sun stroke the patient has usually been exposed to the direct rays of the sun. He may become dizzy and fall or he may develop delirium. In heat stroke there is usually marked restlessness and activity for a time, followed by unconsciousness. The temperature is high, 106 or above; the skin hot and dry; the pulse usually full and bounding.

Treatment.—Note that it differs radically from heat exhaustion. Cool the patient as rapidly as possible by cold baths to which ice has been added. Apply ice to the head and spine and give cold drinks. When the temperature comes down to 100, discontinue cold. If it rises again, repeat the baths, etc.

Poisons

Poisons are substances which, when brought into contact with the tissues of the body, impair the health or destroy the life of these tissues.

For our purpose, we will deal especially with those substances which, when taken into the stomach, are said to cause poisoning. These may be vegetable poisons, mineral poisons, acids or alkalies. One other variety of poison with which we must deal is that from gas, such as sulphur or cyanide gas.

When irritant poisons are taken into the stomach, the signs of poisoning are similar no matter what the variety has been. The most common signs are vomiting and purging. When vomiting or purging occurs suddenly in a healthy person, it is fair to suppose that the condition is due to some poisoning, as this is nature's method of getting rid of it. In most cases of acute poisoning, the pulse becomes very rapid and feeble. The breathing is usually labored and difficult. The skin usually is extremely pale and cold. In the later stages of poisoning, unconsciousness, spasms or paralysis may occur.

Treatment.—When the poison has been taken by mouth, the treatment of poisoning is to aid nature in getting rid of it. This is done by causing vomiting and by cleaning out the intestine as thoroughly and as rapidly as possible. Before the patient is made to vomit, large quantities of fluids should be drunk in order to dilute the poison. As vomiting occurs, this fluid will wash out any poison which may be in the stomach. If the poison has been an alkali, a weak acid, such as vinegar or lemon juice should be given to neutralize it. On the other hand, where poisoning is caused by an acid, weak alkalies,

such as baking soda or lime water or a teaspoonful of wood ashes should be given, to neutralize the action of this acid. If the poison taken is a caustic, such as carbolic acid or bichloride, any albuminous substance, such as the white of an egg or milk should be given to neutralize it.

As soon as possible after these substances have been given, the stomach should be emptied. This can be accomplished by giving large draughts of warm salt water or weak mustard water (one teaspoonful of mustard to a pint of warm water) and then sticking the finger down the throat to cause vomiting. If the patient has taken poison with the idea of suicide, it may be necessary to hold him and give him a hypodermic of $\frac{1}{10}$ of one grain of apomorphin, which will cause vomiting and empty the stomach. To completely get rid of the poison, the stomach washing process (drinking fluid and vomiting it), should be done several times.

In case of collapse, the patient must be put to bed, stimulated with strong black coffee and strychnin, packed in warm water bottles and rolled in blankets.

In case of poisoning by morphin the patient must not be allowed to sleep. He should be kept awake by shaking, by slapping with a cold wet towel or should be kept walking until recovery takes place. Strong black coffee is of decided value and should be given freely. Morphin poisoning can be recognized by the marked contraction of the pupil of the eye when this substance is taken.

In case of poisoning by any of the gaseous chemicals, the treatment consists of getting rid of them by getting the patient into the fresh air as rapidly as possible, and if necessary, performing artificial respiration. It may be necessary to continue artificial respiration for an hour or more in order to get rid of the poison.

Appendicitis

Appendicitis is an inflammation of the *vermiform appendix,* a small finger-like projection connected with the bowel.

While appendicitis is a surgical condition and the only cure for it is an operation yet there are a certain number of cases of the disease which will recover, at least for the time, without operation, if given proper treatment.

Acute appendicitis nearly always begins with a sudden sharp pain in the abdomen. This pain may be felt in the right side, in the middle of the abdomen or in the pit of the stomach. Usually regardless of where it begins it sooner or later settles in the right lower part of the abdomen though often it is felt most acutely in the region of the navel. This pain may be agonizing in character although sometimes not so acute.

The pain is usually accompanied by either nausea, vomiting or both, though occasionally neither may occur. Usually just before the attack the bowels have been constipated.

After the pain has existed for a short time the patient develops a fever though it is not usually high, 101 to 102, which is accompanied by a moderate increase in pulse rate.

In order to decide whether the patient has appendicitis or an ordinary bellyache, a careful examination of the abdomen must be made.

In examining the abdomen, if the patient is suffering from appendicitis, firm pressure made over the lower right side of the abdomen (right side below the navel) causes a marked increase in pain. Even if pressure is made on the left side pain is felt more acutely in the right side and is often increased by the pressure. In addition, and this point is quite important in determining whether we are dealing with a case of appendicitis, the right side of the abdomen, especially the lower right side, is rigid, and on pressure feels harder and more firm than the left. This rigidity is due to spasm of the muscles over the appendix which grow tense in order to protect it from pressure.

Any patient developing an acute pain in the abdomen with nausea or vomiting, a moderate fever, marked tenderness in the right lower part of the abdomen and an increase in the tenseness of the abdominal muscles on the right side, is probably suffering from appendicitis.

Treatment.—Give an enema of soap water to empty the lower bowel.

Stop everything by mouth except water or clear hot tea.

Put the patient to bed and keep him there with an ice bag over the region of the appendix (lower right side of the abdomen).

If the pain is very severe give a hypodermic of ¼ grain of morphine which may be repeated in four hours if necessary.

Withhold all foods for the first two or three days, giving only water by mouth.

If the symptoms subside at the end of this time give fluid diet, broths, milk, etc.

Even if the patient seems better, increase the diet very slowly, giving only soft easily digested foods for several days.

Do not give a cathartic to a patient suffering from appendicitis. Use enemas to move the bowels.

PART IX

SURGICAL FIRST AID

Wounds and Injuries

Under wounds and injuries are included not only mechanical injuries, but the effects of heat, cold, chemicals, etc. Wounds may be lacerations (torn wounds), incised wounds (cuts), punctured wounds, contused wounds (bruises), or crushing wounds.

General Care of Wounds

The most important point in the care of any wound is cleanliness. A great deal more damage may be done by infection (the formation of pus), than by the wound itself.

Open wounds should never be handled if it is possible to avoid it. It is desired to emphasize the fact that indiscriminate attempts at surgical treatment may result disastrously. Under ordinary circumstances, as on shore, it would be possible to obtain the services of a physician or surgeon within a reasonable time, but it is realized that at sea such services often cannot be obtained and for that reason directions are given for treating surgical conditions which would not be advised under any circumstances if the services of a physician would be available within any reasonable length of time. Even where a good-sized open wound exists, it is often possible to close it by strips of adhesive plaster or by simply bandaging the part in such a way as to bring the wound edges together. Where this can be

done, it is preferable to stitching a wound. In the same way in stopping bleeding it is usually possible by applying a dressing and bandaging it firmly in place to stop the hemorrhage, and it is only in rare instances that it will become necessary to pick up a vessel in artery forceps to tie it in order to control hemorrhage.

In handling any wound, it is absolutely necessary that everything which touches it be as sterile as possible and that surgical cleanliness be observed.

Surgical Cleanliness

By surgical cleanliness is meant, not ordinary mechanical cleanliness and freedom from dirt of any kind, but "germ free" cleanliness. Anything and everything coming into contact with a wound must be rendered as nearly free of germs as possible. The wound borders, the hands of the operator, the instruments and thread used in the closure of the wound, as well as the dressings used, must all be prepared (sterilized) before they are used. The process of rendering everything to be used about a wound free of germs is called sterilization.

Sterilization

Sterilization can be accomplished in several ways. Heat alone, either dry or moist (steam or boiling water), will kill germs. Also certain chemicals have the power of killing them.

Sterilization and Disinfection

First aid dressings are usually sterilized in the factory by putting the dressings under 20 pounds of steam pressure for at least one-half hour and then sealing the package. If it is necessary to sterilize dressings aboard ship, this can be accomplished by putting them in the galley oven and heating them until they are almost at the charring point or by subjecting them to a flow of live steam for at least one-half hour. Dress-

ings may also be sterilized by boiling and this method may be used if no other is available, or they may be soaked in 1:5000 bichloride of mercury solution for an hour before use. Gauze or cotton, to be used as a dressing, or for sponging blood from a wound, should be taken from the sterile package carefully, seeing that it is not handled any more than necessary. The hands should always be sterilized before dressings are touched.

Sterilization of Instruments

The instruments, thread, etc., to be used about a wound should be boiled for ten minutes before being used. If no method of boiling is available, they should be soaked in alcohol or 5 per cent. carbolic acid solution for at least ten minutes before use. Do NOT put instruments in bichloride solution.

Disinfection of Hands and Arms

Before a wound is touched, the hands and arms of the operator should be thoroughly scrubbed with a brush in soap and warm water for a period of at least five minutes, unless there is so much bleeding as to make it imperative not to take this much time. During the scrubbing, be careful to clean the finger nails thoroughly. Following the scrubbing, the hands should be rinsed in alcohol and soaked for at least a minute in a solution of bichloride of mercury 1:2000. Following the disinfection of the hands do not touch anything which has not been sterilized.

Preparation of Wounds for Stitching

In handling clean wounds, such as cuts, where there has not been a great deal of dirt carried into the wound, the edges and even the wound itself should be painted with one-half strength tincture of iodine (tincture of iodine, one part; grain alcohol, one part) or still better with a 1 per cent. Mercurochrome solution, which will render the wound sufficiently "germ free" to be stitched without danger. If the wound is large and

jagged, and has occurred over a dirty surface or if dust and dirt have been carried into it, it should first be scrubbed thoroughly with surgical soap and water, then dried and painted with half strength tincture of iodine or Mercurochrome solution before the stitches are put in. If the wound is on a hairy portion of the body, the borders for an inch or more about the wound should be shaved before any stitches are inserted or a dressing is put on.

Suture Material

Catgut, silkworm gut, linen or silk are used for stitching wounds. Silkworm gut, linen and silk stitches must be removed after a certain length of time, usually about ten days. Catgut, on the other hand, is absorbed by the tissues and does not require removal and so is the stitching material used beneath the skin. The skin can be closed with any of the above materials, or if necessary, with ordinary white cotton thread which has been boiled. The stitches should be tied just tightly enough to bring the wound edges together, but not so tightly as to pinch the skin. If they are put in too tightly, they will cut through and do very little good. After the stitching of a wound is complete, the stitch line should be touched with half strength tincture of iodine. Following this, a gauze dressing should be placed on the wound. Should there be any oozing of blood, this can be stopped by a cotton and gauze dressing, put on and bandaged firmly in place.

Bandages and Bandaging

There is a large variety of bandages and bandage material in use. For the purpose of this Manual, however, it is only necessary to describe one or two of these.

For the most part, bandages are used to keep in place surgical dressings, control circulation, limit motion, and afford support, especially in the case of injuries.

The most commonly used and most useful of the bandages is the ordinary roller cotton or muslin bandage, and the

triangular bandage made of the same material (see list of Surgical Supplies, page 62).

The ordinary roller bandage can be purchased already rolled in various sizes. They may be readily prepared by tearing a strip of muslin or cotton in proper widths and in lengths of three to six yards and then rolled, preferably with a special machine made for the purpose. A triangular bandage is a piece of cotton or muslin which usually is made by cutting a piece of the material thirty-six inches square, into two triangular pieces, or folding the piece of material so as to make a triangle. These triangular bandages may also be purchased already made. It is a very useful and widely applicable form of bandage.

In applying an ordinary roller bandage, with one thumb the loosened end of the bandage is held against the part and the roll in the other hand, with the rolled part of the bandage uppermost. The bandage is then wound around the limb with the proper turns until the object of its application is accomplished. It is always wise to use plenty of bandage to hold dressings in place, and it should be properly fastened.

Where the bandaged part requires it, the turns may be reversed, as shown in the cut, in order that the bandage may lie smooth and snug.

In applying any bandage, as a rule, one should bandage from below upwards, from within outwards, avoid all wrinkles and have the bandage snug but not too tight.

There is one other effective way of applying a roller bandage which is known as the figure of eight. In this method of application, after first fixing the bandage with a few spiral turns, figure of eight turns are made up and down the limb or part covering in above and below until they meet. This form of bandage is almost necessary in places like the shoulder and the hip (where it is called a spica) but can also be used in other places quite effectively sometimes.

For the many instances where the triangular bandage may

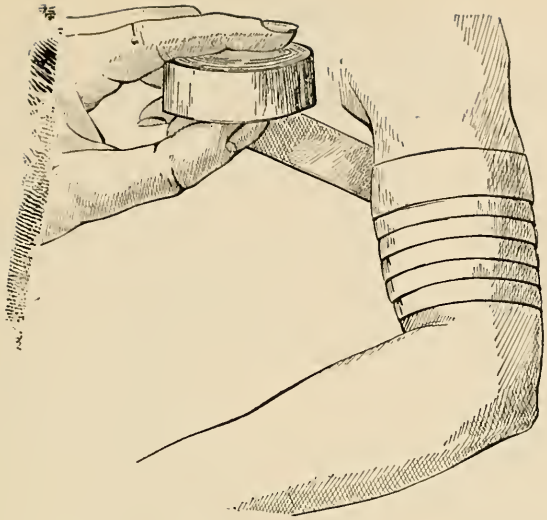


Fig. 12*a*.—The Spiral Bandage. The most common method of application.

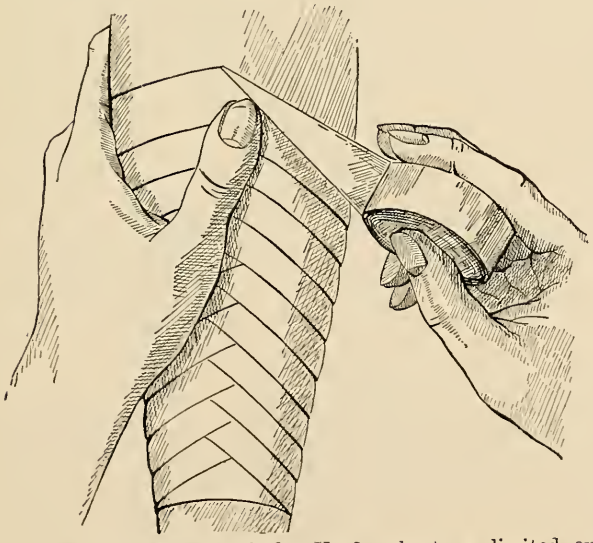


Fig. 12*b*.—The Reverse Spiral. Used only to a limited extent when the contour of the part requires it.

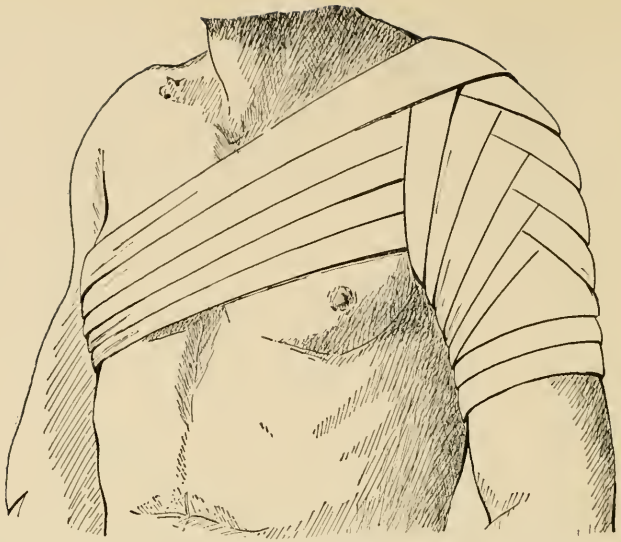


Fig. 12*c*.—The Figure of Eight Bandage (Spica of Shoulder). This form of bandage is of wide application.

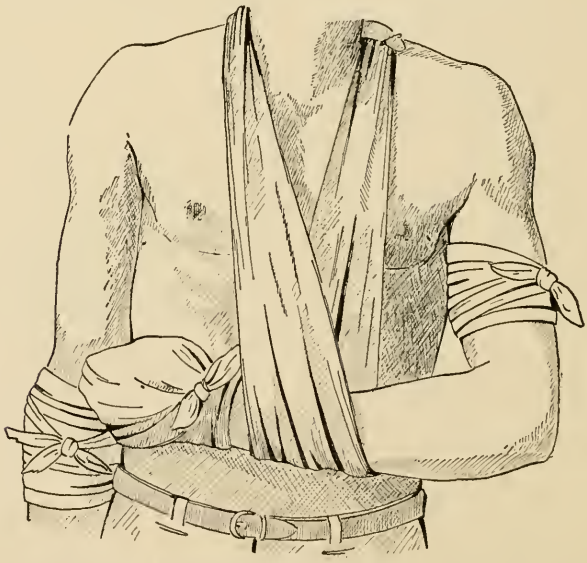


Fig. 12*d*.—The Triangular Bandage. May be widely used in a variety of ways.

be used satisfactorily the reader is referred to Fig. 12d, where it will be observed that this form of bandage is extremely useful for a variety of purposes, especially for first aid.

It is very easy to put on bandages which are either too tight or too loose, and considerable care must be exercised to have the bandage sufficiently snug to hold its place, yet loose enough not to cause pain or interfere with circulation. This can be learned only by experience and if a sick person complains that the bandage is too tight, it should be loosened as necessary.

The fastening of bandages is important. They may be fastened with safety pins satisfactorily; or the final end of the bandage may be split for eight or ten inches, the split ends crossed and then tied around the limb or part, or the bandage may be fastened in place with great satisfaction by using strips of adhesive plaster in various places. The adhesive plaster should be torn in narrow strips of sufficient length and if necessary warmed before applying. With small dressings frequently a bandage is unnecessary and strips of adhesive plaster will hold a dressing in place more satisfactorily than a bandage would. Adhesive plaster sometimes adheres very closely to the skin causing some pain in its removal. It may be removed very satisfactorily with a little gasoline on a piece of cotton.

The student is referred to the various cuts in the Manual for the method of applying bandages in various ways. See pages 126*a*–126*b*.

The Hypodermic Syringe and Its Use

This instrument, page 128, Fig. 12*e*, is used for giving certain drugs under the skin or in the muscles. The action of the drug given this way is much more rapid and certain than when given by the mouth. Both the instrument and its contents should be sterilized before use.

The best instrument is the all glass with capacity of twenty-

five minims. It can be boiled in water to sterilize it if care is taken to take out plunger first, then place plunger and barrel in cold or warm water and let them come to the boiling point slowly. A piece of gauze or cotton must be placed underneath them first or they will crack in the process. After boiling for four or five minutes the plunger should be coated with a little sterile vaseline and reinserted in the barrel. The syringe can then be kept in a clean box wrapped with a piece of sterile gauze always ready for use.

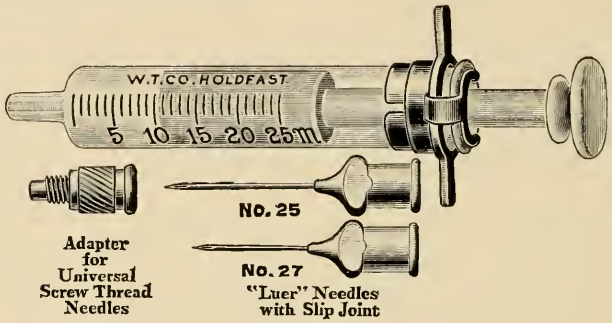


FIG. 12c—All-glass hypodermic syringe with needles.

The needles have a fine bore through which a wire is usually inserted. They rust readily and become plugged. They too should be boiled and dried, the wire removed, dipped in sterile vaseline and reinserted. Then keep ready just as the syringe. Always carry one or two extra needles.

To use the hypodermic syringe a teaspoonful of water should be boiled to sterilize it. The needle may be dropped into the teaspoon and sterilized at the same time. After boiling, the water is drawn up into the barrel of the syringe and the needle picked out of the spoon by its butt and fitted on the syringe. One or more hypodermic tablets, according to the dose to be given, are dropped into the spoon and the water forced out of the barrel of the syringe into the spoon causing the tablet to go into solution.

After the tablet is dissolved, the water containing the medicine is again drawn into the syringe.

Before giving a hypodermic, the skin should be sterilized with alcohol or touched with iodine. A small fold of skin is picked up between the thumb and finger of the left hand and the hypodermic needle is forced into and under the skin at an angle of about forty-five degrees. The plunger is now pushed slowly down, forcing the medicated solution into the tissues after which the needle is removed and the point of puncture rubbed with a little alcohol.

Hemorrhage (bleeding)

Bleeding may be either from an artery, from a vein or the oozing which follows cutting very small vessels. As was pointed out in Part IV, if an artery is cut, the blood comes forth in spurts and is of a bright red color. If it is from a vein, it wells forth slowly and is much darker in color than that from an artery. If no large vessels are cut, the blood oozes from a thousand tiny vessels. This last type of bleeding is easily controlled by pressure and dressings.

To Stop Bleeding from Arteries

Bleeding from a small artery may stop in a short time, due to the plugging to the end of the vessel by the clot which forms. If only a small artery is cut, pressure by means of a piece of gauze directly over the wound will usually stop the bleeding, or a piece of packing (gauze) may be forced tightly in the wound. If the bleeding is from a larger vessel, it may be necessary to catch the cut end of it in a pair of artery forceps, and to tie this cut end with a catgut ligature. It should be remembered that the direction of the flow of blood in all arteries is away from the heart; consequently, when it is necessary to make pressure to stop bleeding, this pressure should be made between the wound and the heart. Sufficient

pressure can be made by the fingers to stop bleeding if the pressure is applied in the right place.

If the bleeding is from the forearm, wrist or hand, pressure of the fingers on the brachial artery along the inside of the upper arm, as shown in the accompanying illustration, Figure

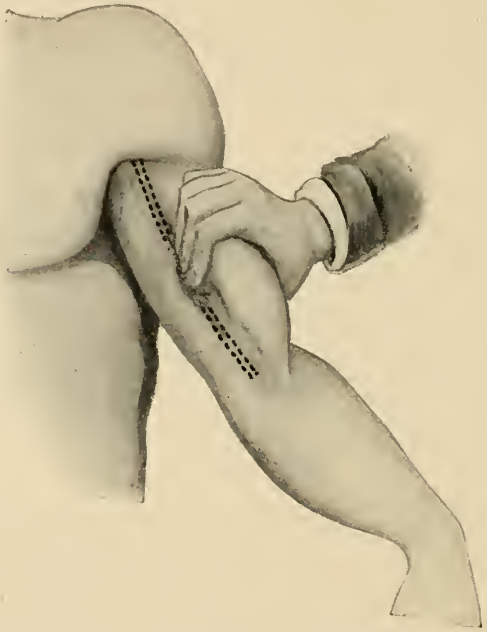


FIG. 13.—Method of stopping hemorrhage (bleeding) by making pressure with the hand on the brachial artery.

13, will be sufficient to stop the hemorrhage. If the bleeding is from the foot, or the leg below the knee, pressure can be made on the femoral artery, the great artery of the leg, in the same way. Figure 14.

Use of Tourniquet.—This pressure is best made by means of a tourniquet. A tourniquet consists of either a piece of

cloth, rope or piece of rubber tubing wrapped about the limb tightly enough to compress the artery. If the vessel is not too large, compression of the artery, by means of a tourniquet, will allow a clot to form in the end of the vessel, so that when

FIG. 14.—Method of stopping hemorrhage (bleeding) by making pressure with the hands on the femoral artery.

the tourniquet is removed, the bleeding will have stopped. If the bleeding is from a larger vessel, after applying a tourniquet, it may be necessary to pick up the vessel with a pair of artery forceps and to tie the end of it in the manner shown in the accompanying illustration. Figure 15.

FIG. 15.—Method of using artery forceps to hold a bleeding vessel while a ligature is tied about the vessel below the point of the forceps.

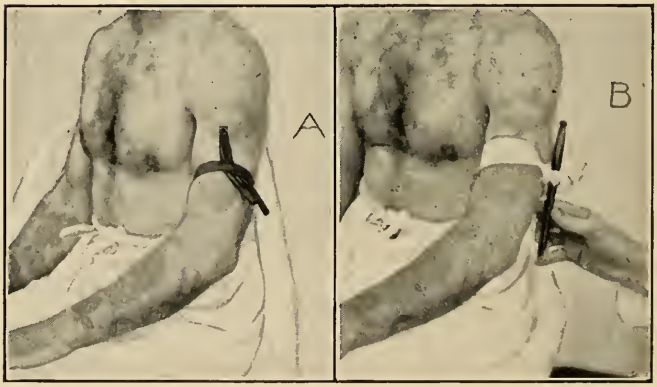


FIG. 16.—(A) Method of stopping hemorrhage by using a small rubber tube for a tourniquet. (B) Showing a piece of cloth used for the same purpose, tightened by a stick passed beneath the knot.

The proper method of using a tourniquet is shown here. Figure 16. A small piece of rubber tubing makes the best tourniquet as two or three turns of it will stop bleeding without twisting it. If tubing is not obtainable or handy, a handkerchief or piece of rag of any sort put about the limb, between the cut and the heart, and twisted tightly with a stick will do quite as well as any form of tourniquet. UNDER NO CIRCUMSTANCES SHOULD A TOURNIQUET BE LEFT ON FOR A GREATER PERIOD THAN ONE HOUR, unless the vessel cannot be found and tied and there is danger of patient bleeding to death. The tourniquet shuts off all blood to the part and if left on for any great period of time, gangrene will develop in the part below it.

To Stop Bleeding from Veins

Blood flowing from a vein is under so much less pressure than from an artery, that it can be more easily stopped by pressure alone, and if stopped by pressure for a little time, the clotting of the blood is sufficient to prevent further bleeding. If the cut vein is large in size, it may be necessary to pick it up in the artery forceps and tie it just as in the case of an artery. Both the upper and lower ends of a cut vein should be tied. It will be remembered that the blood flow in the veins is from the extremity toward the heart, and that pressure to stop venous bleeding must be on the side of the cut away from the heart. Venous bleeding can nearly always be stopped by packing a piece of sterile gauze tightly into the wound.

Capillary Bleeding

Capillary bleeding (bleeding from tiny vessels) can practically always be stopped by a little pressure made with a piece of gauze directly over the wound, or if greater pressure is needed, a few stitches may be inserted in the skin edges and the edges brought together.

The Closure of Wounds

As stated before, wounds may be incised, lacerated, stab, contused or crushing. The clean incised wound is most readily closed and causes least trouble. After the wound edges have been shaved, where necessary, the wound itself cleaned and the bleeding stopped, it may be closed either by drawing the edges together with adhesive plaster strips extending across the wound edges, or stitches should be inserted to bring the edges together. If the wound is deep enough to have involved the muscle, the cut muscle edges should be brought together by means of catgut stitches. After this is done, the skin is closed by means of silkworm gut or silk. Stitches should be put in about one-half inch apart and tied. Do not tie stitches too tightly or they will cut through. Tie just tightly enough to bring the edges together.

The closure of a badly lacerated wound is more difficult than of an incised wound. The chief difference, however, is that in lacerated wounds there is very often more dirt carried into the wound, and it is essential that the wound be thoroughly cleaned before being closed. Large wounds should not be closed tightly. One end should be left open and a small piece of twisted or rolled iodoform gauze put into it to drain off blood, serum, etc., which might collect and cause trouble.

A punctured wound is usually made by a narrow sharp instrument, and unless a large vessel is cut, there is usually very little bleeding from it. If a large vessel should be cut, it may be possible to stop the bleeding by packing sterile gauze tightly into the wound. If not, it may be necessary to use a tourniquet, enlarge the wound and tie the vessel.

Dressing of Wounds

Clean wounds (those which do not contain pus) should be dressed with dry dressings only. The wound borders may be touched with a little tincture of iodine or alcohol or a small amount of alcohol may be put on the gauze which covers the

wound, but unless there is actual pus present, wet dressings should not be used. On the other hand, wet dressings consisting of either bichloride solution (not stronger than 1:5000), boric acid solution, or a solution of table salt (a heaping teaspoonful to a quart of water) are the preferable dressings for dirty wounds (those containing pus). Ointments should never be applied to a break in the skin, except in the case of ulcers such as chancre, chancroid, or on a leg ulcer. Dressings should be changed as frequently as they become soiled or saturated with blood or pus. They should be bandaged on firmly enough to give support to the part but not so tightly as to shut off the circulation. For the support of bruises and sprains, adhesive plaster dressings (i.e., gauze or cotton fastened by adhesive strips across from one side to the other reaching sound skin on both sides) are preferred to bandages, as they remain more firmly in place and furnish better support than bandages.

Abscesses and Infection

Clean wounds usually cause very little trouble, but if pus forms, the patient may become violently ill from it, or it may burrow under the skin or muscles and spread from part to part, causing a great deal of pain together with redness, swelling and fever, or even death.

Treatment of Abscess

Wherever pus forms, it must be gotten rid of. This is usually best accomplished by making a small cut through the skin and then taking the end of a pair of artery forceps or blunt scissors, sticking them into the wound and opening them, thereby spreading the wound and allowing the pus to flow out. Figure 17. In this way, the danger of cutting large blood vessels is avoided.

Pus occurs as a result of infection and this condition may occur in any part of the body. Such conditions are not always called abscesses because they may possess certain pe-

culiarities. The general rule holds good that all collections of pus must be evacuated. Two of these more or less peculiar conditions are mentioned below.

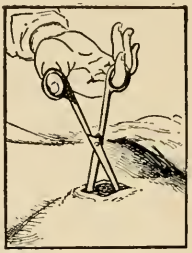


FIG. 17.—Opening an abscess by means of a pair of blunt-pointed scissors. Note that the scissors are not used to cut but only to spread the incision after the skin has been cut through.

Boils

Boils are so common that mention might be made of this condition. A boil is in reality an abscess of the skin and its peculiarities are due to its location. Boils may indicate some general disease, as diabetes, particularly if they recur frequently. They are so common as to need no particular description.

The treatment consists in two incisions, crossing each other, with the removal of the pus and dead tissue, washing out with some antiseptic and the application of hot wet dressings. Boils can also be treated by the application of heat until they soften and burst. This is a longer process and not always a desirable one.

Infected Blisters—Abscess of Hand

A frequent source of trouble aboard ship, especially among stokers and coal passers, is that due to the formation of blisters. These become infected and are followed by abscess for-

mation in the palm of the hand. The hand swells enormously and if the pus is not released, the condition may lead to loss of the hand or to permanently stiff fingers. When an abscess forms in the hand, it should be opened promptly to allow the pus to escape. This is done by picking out the most swollen part and making a cut through the skin at least an inch long and then opening the cut wider with forceps. It may be necessary to make two or three incisions in different parts of the hand. After opening, the hand should be soaked for an hour in warm bichloride solution 1:5000. The bichloride solution will cause the fluids (pus, etc.) to flow out more freely. Following this, the hand should be dressed with gauze, soaked in 1:5000 bichloride solution and the dressing kept wet. If bichloride solution is not available, boric acid solution or even a solution of table salt (a level teaspoonful to the pint), may be used with beneficial results. The hand should be soaked at least twice a day for an hour until the swelling subsides.

Dressing Small Wounds

No matter how small a wound is, it should be properly cleaned and dressed. If this is done, a great many abscesses and infections will be prevented. Even skinned knuckles or scratches should be touched with one-half strength tincture of iodine or 1 per cent. Mercurochrome solution. If the wound is of any size, it should be covered by a dressing and bandaged. Wounds should not be sealed up with liquid court plaster or substances of that sort, unless they are very small and absolutely clean. Pus may form under such a dressing.

Burns and Scalds

The effects of moist and dry heat are nearly the same, except when carried to a point where charring results from dry heat. Burns are classed as first, second and third degree, according to their severity. A first degree burn is slight, causing redness and pain in the skin only; a second degree burn is of greater

severity, extending through the skin and causing the formation of blisters; in a third degree burn, there is an actual charring or cooking of the skin and flesh. Burns are so painful, that the patient may die from the effect of the severe pain alone.

Treatment.—On account of the pain from a severe burn covering a large area of the body, the first thing to do is give morphine. In those cases in which it is needed it should be given in half grain doses, hypodermically. Such dosage is dangerous but in very severe burns may be required. The pain from a burn is due largely to the irritation of the burned area by the air, clothes, etc. The local treatment consists in protecting the burned area from the air. As a first dressing for a burn, there is nothing better than a coating of sterile vaseline. As long as the patient is kept in bed, no other treatment is necessary, no bandages or wrappings of any sort. A liberal application of vaseline is made and the patient covered by a clean sheet. If in the fly season, be sure to use a fly screen over the bed. When blisters form, they should be opened by means of a sterile knife or needle. The blistered skin should not be removed, since it gives a certain amount of protection to the injured parts beneath. When pus forms under these blisters, they should be cut away, as the patient will become very ill if he absorbs the pus confined in the blisters. Where pus forms, wet dressings of boric acid solution (a tablespoonful of boric acid to the pint of water), should be used. These dressings, if kept well saturated, and changed once or twice a day, will tend to drain away the pus and prevent it getting into the system. For small burns, a sterile vaseline dressing covered by clean gauze is as good a treatment as any that can be adopted. In case of a severe burn, the diet should be very light or fluid. The bowels should be cleaned out thoroughly once a day by enema, if necessary.

Cold

The effects of cold most commonly seen are frost bite of the fingers, toes, ears and nose. Usually, the first symptom noted

will be a whitening of the part, with loss of feeling. If the cold continues, the circulation through the part stops. Gangrene may develop. Even with slight frost bites, blisters and sloughing may occur.

Treatment.—In thawing out a frost bitten part, do not use warm water nor bring the part near the fire, as the abrupt change from extreme cold to heat will almost always cause a reaction which may result in gangrene. The best method is to rub the part with snow or ice water, continuing this treatment until the circulation returns, together with feeling and color. After the circulation is restored, apply sterile vaseline dressings or simply smear the parts with sterile vaseline and protect them from further cold. If gangrene has set in and the parts have turned black, it may be necessary to trim off this dark gangrene portion. This can be done without pain as feeling is lost in gangrene.

Bruises

Bruises are due to injury of the tissues by blunt instruments, causing a break in some of the smaller vessels of a part, with a leaking of blood into the tissues and the consequent formation of a black and blue spot.

Treatment.—Minor bruises require no treatment. If of a greater extent, they may require rest in bed. Hot water bags placed on the bruised area, hot flannels and gentle rubbing may hasten recovery. Occasionally, as a result of a severe bruise, a large blood vessel may be ruptured. In this case, it is sometimes necessary to open the bruised area with a knife and forceps, to get rid of the blood clot which lies underneath.

FRACTURES

Fractures are classified as simple, those in which the bone is broken, without pushing through the skin; compound, in which the ends of the bone fragments pierce the flesh and skin;

comminuted, in which there are numerous fragments (crushing and splintering of the bone). There may be any combination of these conditions and, in addition, there may be considerable angular deformity or there may be over-riding of the fragments, causing considerable shortening of the part.

Fractures usually follow more or less severe injuries, except in old persons with brittle bones which break very easily. The head of the thigh bone (femur) may be broken by a false step.

Signs of Fracture.—The signs of fracture are pain, deformity, unnatural movement in the part, crepitus, which is the noise made by the ends of the broken bones moving over one another, extreme pain on pressure over the break, marked swelling of the tissues which become black and blue within a very short time. This is usually accompanied by the formation of blisters on the skin.

Examination for fracture should be made as soon as possible after the accident, as it is more difficult to make out a fracture after the swelling occurs. There may be considerable shortening of the part, especially where there is only a single bone, as in the thigh or the upper arm. There may be no shortening at all, in a fracture of the bones of the lower leg or of the forearm, due to the fact that there are two bones, one of which act as a splint for the other. Shortening in case of fracture of the thigh bone may be as great as three or four inches. Crepitus is a valuable sign of fracture, but cannot always be detected. When other marked signs are present, it should not be looked for, as the soft tissues may be damaged by endeavoring to elicit it and the bone ends may be forced further out of position.

Treatment of Fracture.—When a fracture occurs, before moving the patient some sort of temporary splint must be applied to prevent pain and further injury by the movement of the broken bones, especially if the fracture involve a moveable part like an arm or leg.

Any rigid thing will do for a temporary splint, an umbrella, mop or broom handle or any piece of board. Let the splint

reach across the joints above and below the fracture, and tie in place with a piece of rope or bandage.

One of the best splints to use in moving a patient is a pillow especially where an arm or leg are involved. Use a pillow that is not too soft. Lift the broken part carefully on the pillow and fold the ends of the pillow snugly over, tying in place with pieces of bandage or rope. Such a splint can often be made use of for quite a while in treating some fractures. (See Fig. 27.)

Fractures are attended often with a good deal of pain, and the muscles assume a state of spasm. To meet these conditions morphine is often necessary. (See page 64, No. 5.) It relieves the pain and relaxes the spasm, permitting more satisfactory setting of the fracture. If it were not for the danger, chloroform could be used. Except in the hands of a doctor, however, this is to be avoided.

Splints

Splints serve various purposes. If properly applied, they hold the broken ends of the bones in correct position to one another so that they may heal. If there is movement between the fragments, healing does not take place. Splints also serve to reduce the pain from fracture, by preventing movement. They may be made of any substance which is stiff enough to furnish the necessary support to a broken bone, and are made in many shapes, these shapes conforming to the shape of the part on which they are to be used. The most commonly used splints are straight thin pieces of yucca or basswood about four inches wide and of varying lengths.

Long, straight splints of heavier material are used for fracture of the femur. There are also especially made splints of different shapes to fit the leg and foot or the bend of the elbow. The chief requirement of a splint is that it conform as nearly as possible to the normal shape of the part on which it is to be used, in order that it will hold that part in the correct position. *Great care must be taken to see that splints are*

carefully padded before use. This is best done by covering the splint with a heavy layer of cotton or other soft substance and then wrapping a bandage over this to hold it in place.

In applying a splint to a fracture, great care should be exercised to see that it is not bandaged so tightly as to stop the circulation or to cause a pressure sore. Frequently, splints are bandaged so tightly that they do more harm than good, through the damage they do to the soft tissues. If a splint feels uncomfortable, and is causing pressure, it should be removed, repadded and again adjusted to the part. It is a good idea, especially if there is much pain or temperature following splinting, to carefully remove the splints and see that they are not causing pressure sores. In fracture of the thigh or leg, the pressure of the splint sometimes causes a sloughing of the soft tissues over the heel, leaving an ulcer which may last for weeks or months. Where it is necessary to use a splint on the foot and leg, the heel should be protected by a ring of cotton placed under it or the foot should be raised to take the pressure off the heel.

Except in case of compound fracture, where it is necessary to sterilize the wound edges, the skin should never be painted with iodine before a splint is applied, as the iodine sometimes causes a sloughing of the skin and the flesh under the splint. If it is desired to clean the skin before putting on a splint, it should be washed with a piece of gauze wet with alcohol. According to the site of the fracture, splints must be left on for from three to six weeks. In the case of a heavy weight-bearing bone, such as the thigh bone, a splint should be used for four to six weeks, and no weight should be placed on the limb for two or three weeks after it is removed.

Difference in Treatment of Simple and Compound Fractures

Simple fractures are the easiest to treat. There is usually a single break, and the fragments usually can be readily put into the correct position and held there by means of splints. In

treating compound fractures, however, where the broken bone ends project through the skin, the wound must be sterilized as thoroughly as possible to prevent infection of the bone. Fragments of clothing, splinters and gross dirt must be removed, if necessary, by picking them out or by scrubbing with surgical soap and sterile (boiled) water. Before this is done, from a quarter to a half a grain of morphine should be given by hypodermic to control the pain. After the worst of the dirt is removed, the broken bone ends and the skin around it should be painted with one-half strength tincture of iodine, which should be washed off afterward by a little pure alcohol or with one per cent. Mercurochrome solution. The wound should next be covered by sterile gauze firmly bandaged in place. After this is done, the bone ends should be manipulated into position and splints applied as in simple fracture.

Almost any bone in the body may be broken by an accident, and the treatment, as outlined above, is applicable to any fracture. Certain fractures are more common and will be taken up in greater detail below.

Fracture of the Bones of the Forearm

Either the radius, the bone of the thumb side of the forearm, or the ulna, the bone of the little finger side of the forearm, may be broken. Fracture of the radius is more common, so that the treatment of this condition will be described. Practically the same treatment is applicable for fracture of the ulna.

Fracture of the Radius

In fracture of the lower end of the radius, in addition to all the other signs of fracture, there will be a deformity such as that shown in the accompanying illustration, Figure 18. This deformity causes the lower part of the arm to resemble in shape a table fork and is known as a "silver fork deformity."

Treatment.—Prepare two splints of thin board. The one

for the palm side of the forearm should be long enough to extend from the elbow to the middle of the palm of the hand. The other for the back of the forearm should be a little shorter, but should extend from the elbow to the lower part of the wrist on the back of the hand. These splints should be just a little wider than the arm. They should be carefully padded with cotton or soft cloth. If a deformity exists it should be reduced by making traction (a pull) on the hand while an assistant

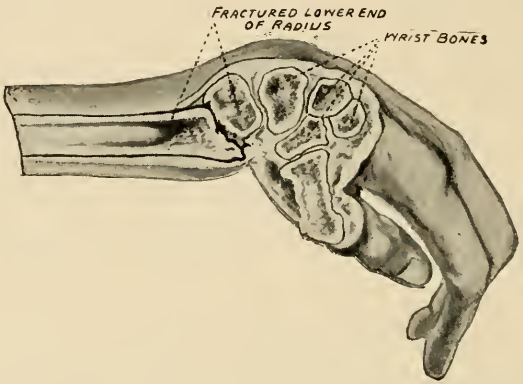


FIG. 18.—Deformity in fracture of the lower end of the radius.

holds the elbow. During this pull, the projecting fragments of bone should be pressed back into their normal position with the fingers of the other hand. The arm should be placed between the splints, in such a way that the thumb will point directly upward and that the palm of the hand will lie against the chest wall. The splints should be fastened, firmly but not so tightly as to shut off the circulation, by means of strips of adhesive plaster. Next, a roller bandage is put on, beginning at the hand and extending to the elbow. The arm should be carried in a sling. These splints should be worn for at least four weeks, though it is advisable at the end of a week to gently remove them in order to rub the skin with alcohol.

Should much swelling occur, it may be necessary to loosen the bandages. Figure 19.

Fracture of the Arm (between the Elbow and Shoulder)

The treatment of fracture of the humerus (the single bone of the upper arm), is much more difficult than treatment of fracture in the lower arm. To get the best results in this fracture, it may be necessary to keep the patient in bed. Fragments of a fractured humerus may be held in place by making a straight splint long enough to extend from the arm pit to the tips of the fingers. This should be padded well, one end more heavily than the other. The heavy padded end of the splint should be placed in the arm pit and the arm bandaged firmly to it, after which the arm and splint may be strapped to the side of the body. If the fracture is in the middle of the shaft of the bone, short splints, extending from the shoulder to the elbow, may be used. These should be four in number and should be placed on the front, back, inside and outside of the arm and firmly bandaged in place. The lower arm should be carried in a sling.

If the fracture is in the upper end of the bone near the shoulder, it can best be held in place by making a shoulder cap of pasteboard or substance of this sort. This should extend over the shoulder and down to the elbow. The arm should then be bound firmly to the side of the chest.

By using a small, well padded triangle, eight inches each way, in the arm pit and then binding the arm firmly to it and the chest wall, by adhesive plaster, and supporting the forearm in a sling, quite satisfactory results can be obtained. Figure 20.

Fracture of Clavicle (Collar Bone)

Fracture of the clavicle (collar bone) is a frequent occurrence, due in part to its exposed position, but more to the fact that the bone itself is of very slender construction and breaks easily.

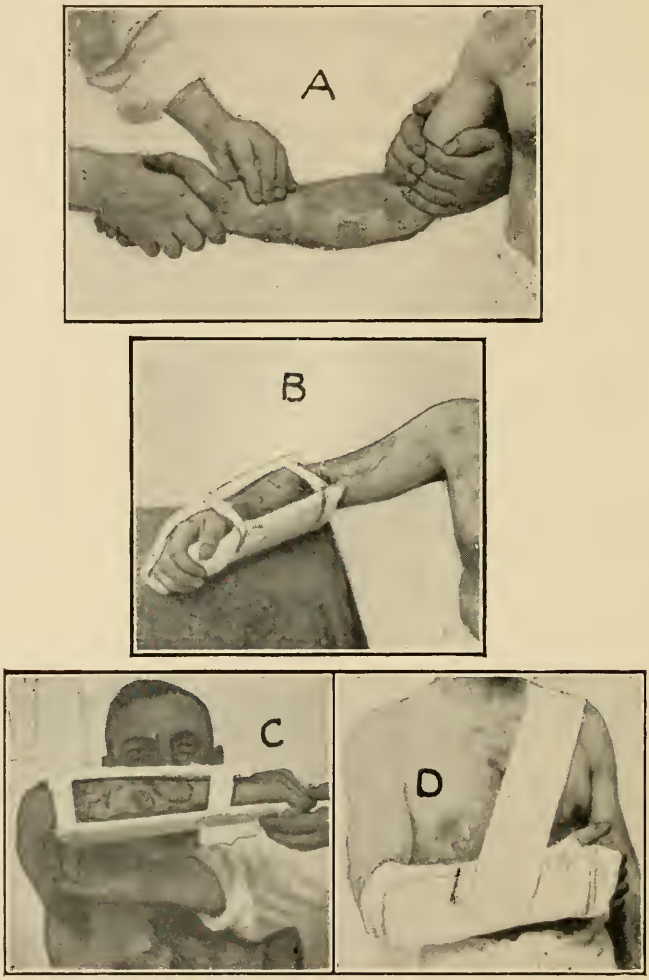


FIG. 19.—(A) Reduction of a fractured bone of the forearm. (B and C) Proper length splints held in place by adhesive strips. (D) Dressing completed.

As a general rule, fracture of this bone is due to direct force applied to the bone itself, although frequently the result of a blow over the outer part of the shoulder. There is usually overlapping of the fragments of the fractured bone, so that measurements made of the injured and uninjured sides will show some shortening on the side where the fracture exists. In addition, the patient is usually unable to elevate the arm and furthermore, the point of the shoulder of the affected side drops downward and forward. The fracture can usually be distinctly felt under the skin.

Treatment.—The treatment consists, as in the case of all fractures, in putting the bone fragments into as good a position as possible and holding them there. Since the point of the shoulder usually drops downward and forward due to loss of the support of the clavicle, in "setting" the fracture, the affected shoulder must usually be forced upward and backward to bring the bone fragments into good position. Before applying bandages or other dressings, the skin should be cleansed carefully and a small pad of cotton or gauze placed in the arm pit.

The arm should be bent at the elbow and the upper arm placed flat against the side of the chest wall. (See Figure 20A.) Using a strip of adhesive plaster about 6 inches wide and 2 feet long, or a number of narrow strips bind the upper arm firmly to the chest, as shown in Fig. 20B. Next place a pad of gauze or cotton between the elbow and the chest, and using a long roller bandage further bind the arm to the chest, carrying the bandage over the point of the elbow of the injured side and up over the shoulder of the opposite side. This will raise the shoulder on the affected side and bring the bone fragments into good position.

If the dressing is properly fastened, this should fix the arm and shoulder firmly enough so that the patient can move about without danger of disturbing the position of the bone. If adhesive plaster is not available, a bandage can be used in the same way to hold the arm firmly to the chest. (See Fig. 19D.)

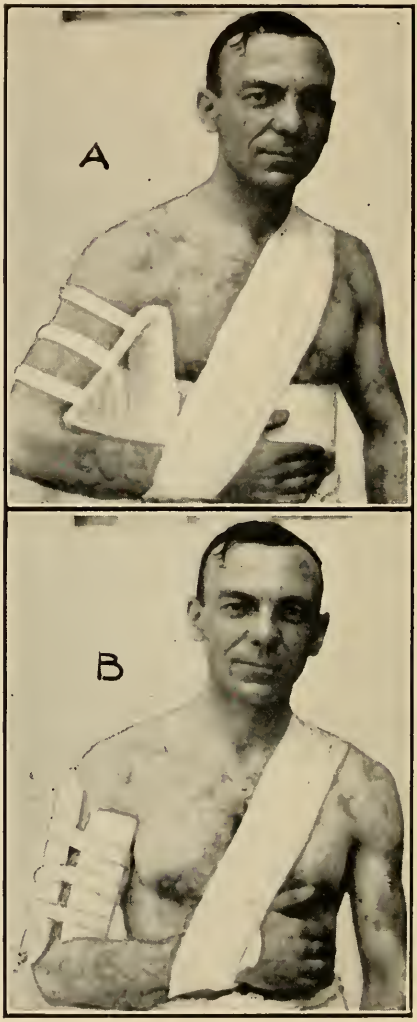


FIG. 20.—(A) Method of use of triangular splint for fracture of the bone of the upper arm. (B) Method of use of 4 small padded splints (tree box) for the same purpose.

The dressing should remain in place for about four weeks, although it may be necessary to change it once or twice on account of irritation of the skin from the adhesive plaster.

Fracture of the Femur (Thigh Bone)

Fracture of the femur, or thigh bone, usually follows a more or less severe injury. Occasionally, as stated above, in the

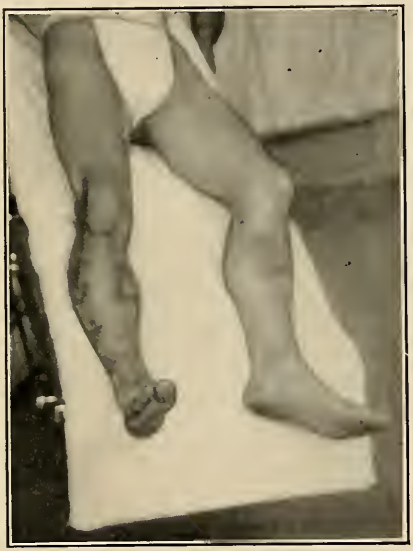


Fig. 21.—Turning out (eversion) of the foot in fracture of the upper end of the left femur.

case of old people it may occur from a very slight injury. In fracture of this bone, the patient will be unable to step on the affected leg. When lying at full length, the toes and foot of the affected leg turn out, as shown in the accompanying illustration, Figure 21. If a measurement is taken of the two legs, measuring from the top of the hip bone to the lower end of the

inside of the ankle bone, the broken leg will be found to be from one to four inches shorter than the good leg.

Treatment.—The treatment in these cases is to get the patient into a firm bed, and to make a continuous pull on the leg, if there is any shortening. A traction arrangement can be fixed up in the following manner: See illustration, Figure 22. Several adhesive plaster strips are fastened to the skin of the thigh beginning two-thirds the way to the hip and extending

FIG. 22.—Buck's extension with weights and pulley for fracture of the femur.

half-way down the lower leg. Shave the skin before applying plaster. At least four of these strips will be necessary. These are bandaged to the leg and brought down and fastened to a small block. A rope is fastened to this block and this is carried through a single pulley. A weight of from ten to twenty pounds is attached to the end of the rope. It will be necessary to elevate the foot of the bed or to fasten the patient, in some way, to prevent his sliding against the foot of the bed. The idea of this arrangement is to cause a continuous pull, day and night, on the leg to prevent shortening and if the patient

slides against the foot of the bed this pull is lost. An apparatus of this sort must be kept on for from four to six weeks. The patient should be kept in bed for a considerably longer period. No movement should be permitted that can possibly be avoided. It will be necessary during this time that he use a bed pan.

Another method of treatment of fracture of the femur, especially where it is necessary to move the patient, is to use

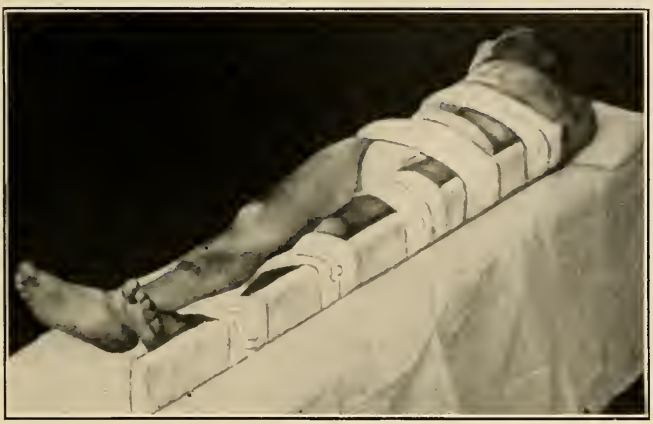


FIG. 23.—Long single splint extending from arm pit to below the foot for fracture of the femur.

a long, single splint extending from the arm pit to the foot. This is strapped and bandaged to the leg and body, in the manner shown in Figure 23.

Still another method of treatment is to use sand bags (each about four to four and one-half inches in diameter and about two feet long), to hold the injured leg in the proper position. This form of treatment will hold the bone sufficiently quiet to allow healing, but usually results in some shortening of the leg. Elderly people should be propped up in bed, to prevent the development of pneumonia which may occur if they are kept

flat on their back for any length of time. In any method of treatment of fracture of the femur, keep the leg straight and the toes straight upward.

Fracture of the Bones of the Lower Leg

Fracture of the bones of the lower leg is a very common injury and is usually due to direct violence. The most common form of fracture is that shown in the accompanying illustration, Figure 24, which is known as Pott's fracture. The treatment, as in the case of fracture of the bones of the forearm, consists in lining the bones up, comparing them with the opposite leg and then putting the leg and foot into a well padded splint. A splint such as shown here is convenient for this type

FIG. 24.—A common type of fracture (Pott's) about the ankle joint.

of fracture. Figure 25. Pott's fracture, in which there is some outward displacement, can be treated by using a straight board splint long enough to extend from the knee to about four inches below the sole of the foot. This should be well padded, having the padding exceptionally heavy just above the ankle and not extending quite to the lower end of the splint. The splint should be applied to the inside of the leg so that the foot and ankle will extend below the padding. In bandaging

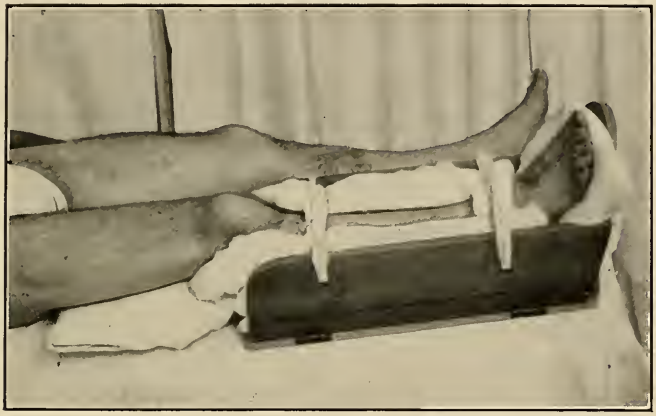


Fig. 25.—Use of wooden fracture box for fracture about the ankle.

the foot and leg to the splint, the outward displacement will be corrected. Figure 26.

A feather pillow wrapped around the leg and foot and bandaged in place, makes a good emergency splint for fracture about the ankle. Figure 27.

Fracture of the Ribs

The symptoms are, severe pain on taking a long breath; pain when pressure is made over the front and back of the chest at the same time, and in severe cases, spitting of blood from injury to the lung.

Treatment.—The treatment of fractured ribs consists in keeping the chest wall as quiet as possible, by strapping with adhesive plaster. This is done in the following manner. Figure 28. The straps must be overlapped and must extend from the middle of the chest in front, to the backbone behind. Each one should be put on after the patient has blown out all

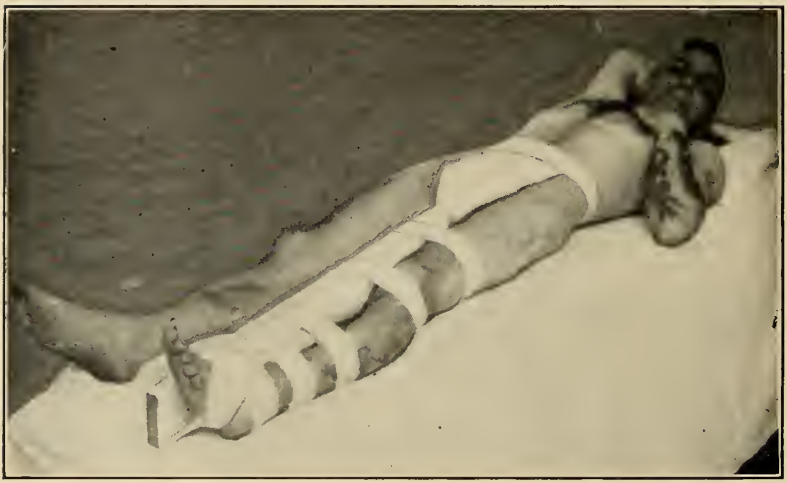


FIG. 26.—A single well padded internal splint for fracture about the ankle.

the air from his lungs. In this way, the straps can be made tight enough to keep the chest from expanding.

Fracture of the Jaw

Fracture of the jaw often occurs from a blow on the chin. Following this injury, the teeth will not meet properly (are out line). If the two sides of the jaw are grasped in the fingers, grating of the fragments may be felt. The treatment consists in bringing the teeth into as good a position as possible and then bandaging the jaws tightly by means of a band-

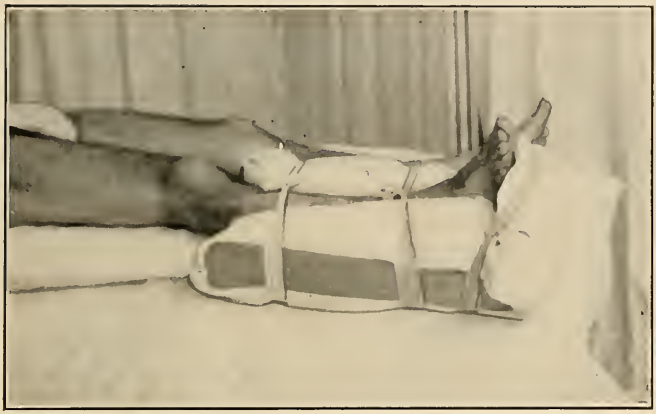


FIG. 27.—Use of a pillow as a splint for fracture about the ankle.

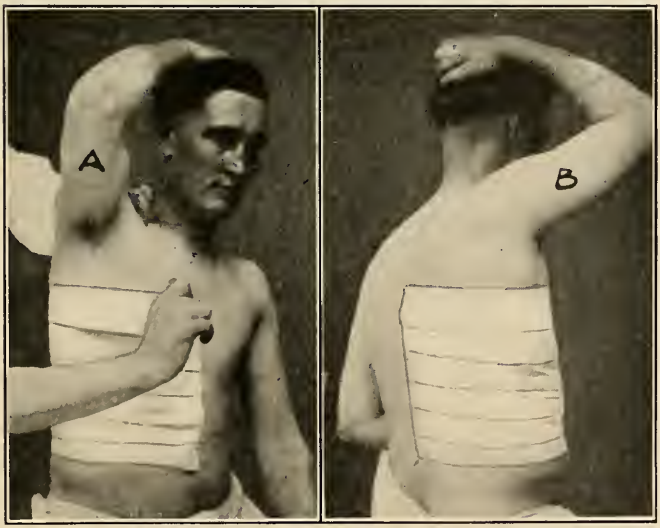


FIG. 28.—(A) Method of applying adhesive strips for fractured ribs. (B) Adhesive dressing for fractured ribs completed.

age which goes over the point of the chin, and is fastened on top of the head and at the back of the neck. Figure 29.

If small silver or copper wire is available, the fragments of the patient's jaw may be kept in place by passing wires between the teeth on each side of the break and twisting them together. The mouth should be washed out very carefully several times a day with alkaline antiseptic solution. The food should be very soft or fluid.

FIG. 29.—Method of using a two tailed bandage for fracture of the jaw.

Fracture of the Skull

Severe fracture of the skull is usually accompanied by bleeding from the ears, mouth and nose or by hemorrhage into the space behind the eye ball. The fracture may be merely a depression of the vault of the skull. The injured person may or may not become unconscious at once. He may lose consciousness two or three hours after the injury and may never recover. Very little can be done for these patients at sea except to put them to bed, keep them as quiet as possible with an ice cap to the head. Recovery is usually very slow and may leave some mental defect.

Fracture of the Spine

Fracture of the spine occurs occasionally, especially in falls from aloft. If severe, it may result in paralysis of all parts below the fracture, with loss of control of the bowels and bladder. The only treatment that can be instituted in these cases is to keep the individual as quiet as possible in bed and to place sand bags about him to prevent movement. Keep the patient clean and dry. Make pads of cotton or waste and gauze to use as diapers.

Fracture of the Pelvis

The bones of the lower part of the trunk form the pelvis. They are sometimes broken by severe crushing injuries or falls. The treatment consists in keeping the patient in a hard bed and as quiet as possible. Sand bags should be placed on each side of him and held in place by a broad muslin bandage passing around both the hips and the sand bags.

DISLOCATIONS

Dislocation is a condition in which the normal relation of two or more bones of a joint is changed; in other words, one or more of the bones is "out of place." Dislocation of a part is usually accompanied by severe stretching or tearing of the straps (ligaments) which hold the bones together. Each joint in the body is surrounded by a heavy, tough membrane. This membrane surrounding the joint is called the capsule. When this capsule is torn and the end of the bone projects through it, it may be very difficult to put the end of bone back into place.

Almost any joint in the body may be dislocated. The most common dislocations, however, are of the fingers, shoulder and hip. The condition nearly always follows an injury, quite frequently, a fall. Deformity is always present in a dislocation and the head of the bone can usually be felt outside the socket. There will be no crepitus as in the case of fracture.

The part cannot be moved, due to the fact that the muscles lock the joint in one position to protect it. Reduction of a dislocation consists of putting the head of the bone back into its proper place.

In case of dislocation of the finger, grasp it firmly, make a straight pull and with the fingers of the opposite hand, force the bone end back into place. When a dislocation is put back in place, a snap or crack will usually be heard as the bone falls back into its socket.

Dislocation of Shoulder

In dislocation of the shoulder, the head of the humerus (upper arm bone) usually drops downward into the arm pit, though it may go forward or backward. In any case, the head

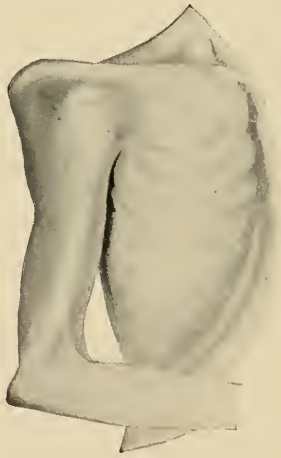


FIG. 30.—Dislocation of the shoulder joint.

of the bone can be felt outside the socket. This causes a flattening of the point of the shoulder and gives an appearance such as is shown in the accompanying illustration. Figure 30.

In dislocation of the shoulder, when the elbow of the affected arm is placed against the chest wall, the hand on the affected side cannot be placed on the opposite shoulder, or with the hand on the shoulder, the elbow cannot be brought to the chest wall.

Treatment.—The simplest treatment is to lay the patient flat on his back on a table or on the deck; the operator removes a shoe, places his unshod foot in the arm pit against the head of the bone, and makes firm traction (pull) on the arm. This traction should be at an angle of about 45 degrees from the body. This method is especially applicable to dislocation where the head of the bone is in the arm pit. In most cases, this procedure will bring about an immediate reduction of the dislocation. When the dislocation is reduced, the arm at the shoulder becomes freely movable. Following reduction, the arm should be put in a sling and kept quiet for at least a week, preferably two weeks, since if there is a tear in the capsule of the joint, the bone may easily slip out again unless sufficient time is given for healing of the stretched and torn tissues.

Dislocation of the Hip

Dislocation of the hip usually follows a more serious injury than that leading to dislocation of the shoulder joint. In dislocation of the hip, the toes of the affected side turn inward and, on account of the shortening, rest against the upper part of the instep of the opposite foot. The thigh and leg are turned inward with the thigh partly flexed on the body. The leg can not readily be straightened. If measurement of the affected leg is made, usually about two inches of shortening will be found. Do not confuse dislocation of the hip and fracture. In fracture, the leg and toes usually turn out; in dislocation, they turn in. In addition, in fracture, there is too free motion of the parts, while in dislocation, motion is nearly abolished. The appearance of hip joint dislocation is shown in the accompanying illustration. Figure 31.

Treatment.—The reduction of dislocation of the hip joint can usually be accomplished by gentle manipulation; the idea being to carry the head of the hip bone back through the same course through which it came in the process of dislocation. Lay the patient on his back on the deck. Bend the leg on the thigh and the thigh on the body. Grasp the foot and ankle in one hand placing the other hand under the knee to guide it. With the leg and thigh flexed, carry the knee of the affected

FIG. 31.—Partial flexion and internal rotation in dislocation of the hip.

leg well over the midline toward the good leg. Next, throw the knee of the affected side outward, at the same time rotating the thigh outward by carrying the foot of the affected side toward the good side and at the same time forcing the knee of the affected side outward. Next, straighten the thigh and leg on the body. No great force is necessary in reducing dislocation of the hip and treatment of this sort will usually bring about a reduction. Too much force may lead to fracture of the bone.

Dislocation of Jaw

The lower jaw is occasionally dislocated by yawning widely, or by a blow on the point of the jaw when the mouth is open. If the jaw is dislocated, the patient will be unable to close his mouth, the jaw standing half open. The condition is very painful.

Treatment.—The treatment consists in wrapping the thumbs thoroughly in cloth, cotton or bandages, placing the two thumbs on the back teeth of the lower jaw, forcing down with the thumbs and at the same time using the fingers to pull up on the point of the jaw. This will snap the jaw back into place. Be careful that the thumbs are not badly bitten when the jaw snaps back into place, as the mouth will immediately close tightly when the dislocation is reduced.

Treatment of Dislocations in General

The treatment of other dislocations is very much the same as above; namely, manipulate and make extension until the bones are brought back into their proper position, after which the part is kept quiet for some time to allow healing of the stretched and torn tissues surrounding the joint. Dislocations are often associated with much pain and the muscles may show the same sort of spasm as occurs in fractures. Morphine may often be given with advantage just as in the treatment of fractures (page 64, No. 5).

SPRAINS

A sprain, or a strain, of a joint is a condition due to overstretching or tearing of the ligaments or straps holding the bones of a joint together. A sprain is not followed by deformity other than swelling, though the tissues around the joint become black and blue.

Treatment.—The treatment for this condition is rest, soaking in extremely hot water and the application afterward of adhesive strips to hold the part from moving. The method of

using adhesive strips for a sprained ankle is shown in the accompanying illustration. Figure 32. If the sprain is not severe, soaking in hot water followed by a thorough rubbing with liniment will be sufficient, though the soreness from a

FIG. 32.—Method of applying adhesive strips for sprain of the ankle.

sprain remains for several days, or possibly weeks. If severe enough to require rest in bed, an ice bag over the part will prevent swelling.

Effects of Electricity

Electricity has both a general and a local action. The general action consists of a shock accompanying the passage of a strong electric current through the body. This may lead to momentary unconsciousness, to prolonged unconsciousness or perhaps to death. Should some member of the crew come

into contact with a strongly charged electric wire, he will be unable to let go of this wire or to get away from the electrical contact because of the spasm of the muscles. The current should either be immediately shut off, if this is possible, or if not, the victim should be pulled away from the electric wire. In doing this, use rubber gloves, a piece of rubber packing or other non-conducting material to grasp the body. If nothing of this sort can be found, a strip of dry cloth or a dry board may be used to break the contact. Whatever is used must be non-conducting material or the rescuer will find himself in the same condition as the original victim. The local effects of electricity consist of burns very similar to those caused by fire or chemicals except that they heal more slowly.

Treatment.—The treatment of electric burns is the same as the treatment of ordinary burns. (Page 137.) For unconsciousness following electric shock use artificial respiration.

Drowning

In an individual apparently drowned, the face should be exposed, the mouth and nostrils cleansed of water or mud, and the clothing should be opened to give free access to the chest. Next, turn the patient on his face and place under the upper part of his abdomen a roll of clothing, a blanket, or anything which will cause the head to hang down and will allow the water to drain from the lungs. Drainage may be aided by making pressure over the lower part of the back. This may also be done by standing over the patient, lifting him by the middle of his body and holding him for a moment or two in this position. During this time, the mouth should be held open and if possible the tongue should be pulled forward. After all the water is drained from the lungs start artificial respiration.

Artificial Respiration

Place the individual on his stomach with one arm above his head and the other arm supporting his head, which should be turned somewhat to one side. While standing or

kneeling astride the patient, facing his head, the palms of the hands are placed over the lower part of the patient's chest and by throwing the weight forward, pressure is made against the lower part of the chest, decreasing the capacity of the chest and forcing out the air which may be contained in the lungs. When the pressure is removed, air will be sucked into the lungs by the springing out of the chest wall. This motion is continued slowly about twelve or fourteen times to the minute, no faster. If an assistant is at hand, continuous rubbing of the limbs of the patient toward the body may aid in restoration. Do not stop artificial respiration under two hours, as there is still a chance to restore life, even after this period of time. As soon as breathing is established, remove any wet clothing, wrap in warm blankets, place in bed and allow rest for at least forty-eight hours. Figure 33, page 165.

Childbirth

Occasionally, childbirth occurs at sea and it becomes necessary for an officer or member of the crew to attend the birth. With the exception of the final care of the infant, no medical attention is required for normal childbirth.

At the conclusion of "term" (about 280 days), the woman begins to have cramps in the back and lower part of the abdomen. These cramps are called labor pains. They begin very gently and increase gradually in strength and frequency until the birth of the child. The "bag of waters" bursts during labor; usually, near the conclusion of the labor, shortly before the child is born. Under normal conditions, the child is expelled head first and face down, when the woman is lying on her back. As soon as the head is born, the body and limbs follow very quickly. At times, if the pains are weak, it may be necessary to aid the birth of the child, by hooking a finger into the arm pit and making traction.

Care of the Child

Immediately after the child is expelled, its mouth and nose should be wiped free of blood and mucus, and, if it does not

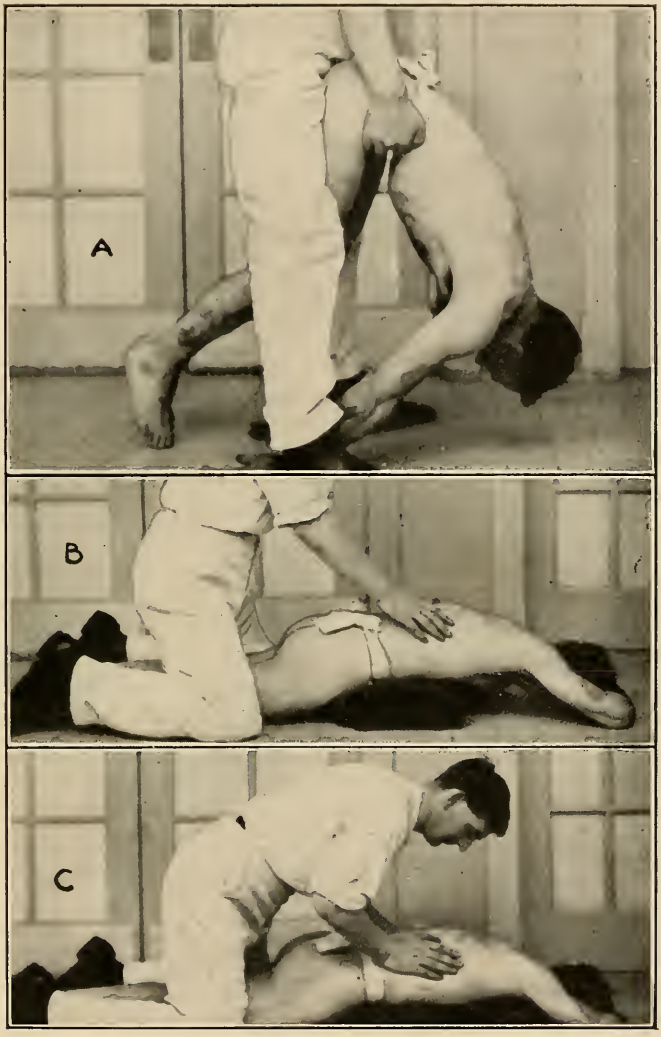


FIG. 33.—Resuscitation of the drowned. (A) Draining water from the lungs. (B) Position for artificial respiration. (C) Compressing the lower part of the chest to expel air from the lungs; this is followed by position shown in B, which allows the chest to expand and draw air into the lungs.

cry or show immediate signs of breathing, it should be slapped gently on the buttocks, or a few drops of cold water sprinkled over it. Usually, this will cause it to cry vigorously. Do not hurry or get excited at this stage, as the child can be allowed to lie beside the mother or between her legs while arrangements are made for its care.

The cord, extending from the mother to the child, must next be cut. It is first tied by a bit of twine or cord, which has been boiled, about one inch from the child's belly. It is tied in a second place about one-half inch beyond this, and the cord is cut between these two ligatures.

At the time of birth, the child will usually be found covered by a thin coating of a whitish waxy substance. This is best removed by thoroughly oiling the skin with a bland oil such as olive oil, after which the child should be carefully bathed in warm water and white soap. After the bath, the stump of the cord is dressed. Dressing the stump of the cord consists of powdering it with boric acid powder and placing on the stump a small pad of sterile gauze which should be held in place by means of a belly-band about four inches in width which goes around the child and is pinned in the back. The cord stump should be dressed each day. After about a week or ten days, the stump of cord falls off, leaving a small raw area which should be dressed as indicated above until completely healed.

After Care of the Mother

Immediately after the child is born, the labor pains usually cease for a time, and begin again in from ten minutes to a half hour, and continue until the "after-birth" is expelled. The expulsion of the "after-birth" is usually followed by a single gush of blood. This stops almost immediately, especially if the lower part of the woman's abdomen is gently kneaded. If bleeding continues, it may be necessary to give a teaspoonful of fluid extract of ergot, if available, and continue the massage of the abdomen. Next, a clean, sterile pad should be placed over the woman's genitals and fastened by means of a "T" binder, the large end of which goes between her legs and is

attached to a belt around her waist. The mother should remain in bed for at least a week, preferably longer, after the birth of the child. The baby may be put to the breast, for nursing, immediately after birth, although little nourishment will be secured for a couple of days as the milk does not "come in" for about two days after the child is born. In the meantime, it should be given a little slightly warmed water to drink every two or three hours.

Stricture of Urethra (Water Passage)

Stricture is a narrowing of the urinary tube. It is usually a result of long continued gonorrhea, although it may be caused by some form of injury. Stricture usually develops very slowly and it may be several months or years after an attack of gonorrhea before it develops or before it becomes difficult to pass water. In severe cases, the stream gradually becomes smaller and smaller, until finally the urine can only be forced out drop by drop.

Treatment.—The treatment of stricture must be carried out by a physician. It occasionally happens that there is acute retention of urine in the bladder associated with stricture or from some other cause. When retention occurs, the bladder may become greatly distended so that it forms a tumor-like mass in the lower part of the abdomen. When this occurs, it may be necessary to draw the urine. Sometimes retention of urine is the result of spasm of the muscle, in which case it may be possible to relieve the condition by placing the patient in a hot bath and having him attempt to urinate while in the bath, or hot compresses (cloths rung out of hot water) may be placed between his legs, around the scrotum and penis, in an attempt to relieve the spasm. Occasionally a hot mustard foot bath will bring about the desired result. These methods should be tried before an attempt is made to pass a catheter.

Catheterization

An attempt should always be made to pass a rubber catheter before resorting to the metal one. The catheter should be

sterilized by boiling before use. It should then be oiled with sterile vaseline and after cleaning the mouth of the urethra (water passage) with a piece of cotton wet in bichloride solution the catheter should be gently passed into the water passage and an effort made to force it back into the bladder. The catheter usually goes in about eight to ten inches before it enters the bladder. It is best to try to pass about a number nine soft rubber catheter at first. If this cannot be used, a smaller one may be tried.

If the passage of the rubber catheter cannot be accomplished, the metal one should be boiled, the end dipped in sterile vaseline and an attempt made to pass this. Figure 34

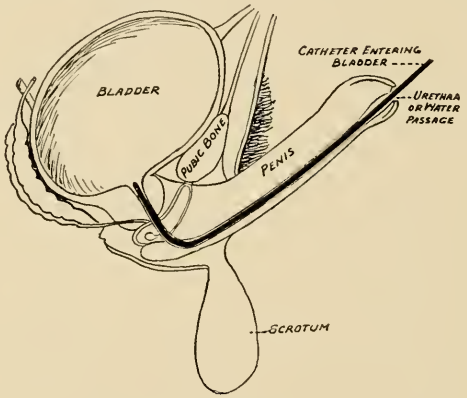


FIG. 34.—The course through which a catheter must pass to enter the bladder.

shows the course through which the catheter must pass to enter the bladder. Do not use any force in passing a catheter.

Occasionally, the catheter cannot be passed into the bladder and it becomes necessary to make a small incision through the skin just above the pubes, the bone in the front of the lower part of the belly, and puncture the bladder through this opening. If it is possible to obtain the services of a physician in any reasonable time, this operation should never be attempted.

Piles

Piles are dilated veins of the rectum. When inflamed, they are very painful, causing a constant burning sensation about the anus which is greatly increased during and after bowel movements. When the veins rupture, the condition is known as "bleeding piles." Piles are often due to long continued constipation, and when the constipation is relieved they disappear.

Treatment.—If the piles protrude or if they become strangulated, they should be pushed back with the finger or with a cloth thoroughly coated with oil or vaseline. See that the bowels move regularly, at least once a day. Use a low enema if necessary. If the piles become strangulated and cannot be pushed back, use hot applications. Long continued piles require an operation for their cure.

Hernia (Rupture)

A rupture is a condition in which the contents of the belly cavity are forced out through a defect or split in the muscles. A rupture usually shows as a lump formation in the groin or just below the groin in the thigh or in the scrotum. A rupture is not dangerous as long as the muscles do not draw together and pinch the contents of the sac. When the muscles draw together and pinch the contents of the hernial sac, the hernia is "strangulated."

Should strangulation occur, an immediate attempt should be made to reduce (force the contents of the hernial sac back into the belly) the hernia, by making gentle pressure over the outside of the sac, at the same time kneading and manipulating the mass in an endeavor to pass the contents back into the belly. Very little force should be used, as it is possible to rupture the gut in attempting to reduce a strangulation.

If the hernia remains strangulated, and medical help is not available within twenty-four hours, the outlook for the patient is extremely serious as continued strangulation usually

results in death. Therefore, it is highly necessary that the hernia be reduced. An attempt should be made to relax the muscles sufficiently by flexing the thigh on the body and then attempting to return the hernial contents back into the belly. If this cannot be accomplished it may be necessary and advisable to give chloroform to thoroughly relax the muscles in a further attempt to reduce strangulation.

When a hernia becomes strangulated, this strangulation is accompanied by a great deal of pain and within a comparatively short time is followed by continuous vomiting. Occasionally, there will be a marked looseness of the bowels (diarrhea), for a short time, followed by an inability to make the bowel move at all. This is due to the fact that a loop of the gut is caught in the hernial sac and nothing can pass through it. In case of a severe strangulation of a hernia which cannot be reduced, the patient should be taken immediately to the nearest doctor for operation. If the strangulation continues, it nearly always means the death of the patient.

Foreign Bodies in the Eye

The removal of a small foreign body from the eye is usually very simple but occasionally where the foreign body becomes imbedded in the eye ball, it is considerably more difficult. If it is not imbedded, a bit of cotton wrapped around the end of a tooth pick or match stick can be used to brush the foreign material off the eye ball. If it is imbedded, it will be necessary to cocainize the eye by dropping into it one drop of 1 per cent. cocain solution every three minutes until three or four drops have been put in the eye. After this is done, it will be found that the eye ball has lost its sensitiveness, so that the foreign body may be removed without pain to the patient, by using the flattened end of a clean tooth pick. Great care should be taken that the eye ball is not scratched more than necessary. Following the removal of the foreign body, the eye should be washed with boric acid solution two or three times a day and if very painful should be bandaged for a day or two.

APPENDIX

EXCERPTS FROM REGULATIONS, UNITED STATES PUBLIC HEALTH SERVICE

Hospital Service for Sick and Disabled Seamen

Paragraph ‡590. The following persons are entitled to the benefits and facilities of the hospitals and other relief stations of the service as hereinafter described:

(1) Persons (hereafter designated as American seamen) employed on board in the care, preservation, or navigation of any registered, enrolled, or licensed vessel of the United States, or in the service on board of those engaged in such care, preservation, or navigation.

(2) Officers and enlisted men of the Coast Guard.

(3) Officers and seamen on vessels of the Coast and Geodetic Survey.

(4) Officers and crews of vessels, certain keepers and assistant keepers of the Lighthouse Service.

(5) Officers and crews of vessels of the Bureau of Fisheries.

(6) Immigrants detained at Ellis Island.

(7) Seamen from vessels of the Army Engineer Corps and Army transports, or other vesels belonging to United States Army.

(8) Seamen employed on the vessels of the Mississippi River Commission.

(9) Beneficiaries of the Employees' Compensation Commission.

(10) Patients of the Veterans' Bureau.

(11) Lepers.

(12) Pay patients designated as such under departmental authority, as officers and enlisted men of the United States Army and Navy.

(13) Officers of the Public Health Service and employees of the Public Health Service on field duty.

¶591. No person employed in or connected with the Navigation, management, or use of vessels under 5 tons, or canal boats engaged in the coasting trade, shall, by reason thereof, be entitled to any benefits or relief from the service.

¶593. Sick or disabled seamen taken from wrecked vessels of the United States returned to the United States from foreign ports by the United States consular officers, if sick or disabled at the time of their arrival in a port of the United States, shall be entitled to the benefits of the service without reference to length of service.

¶594. A sick or disabled seaman, in order to obtain the benefits of the service, must apply in person, or by proxy if too sick or disabled to do so, at the office of the Public Health Service, to an officer of that service, or to the proper customs officer acting as the agent of the said service at stations where no medical officer is on duty, and must furnish satisfactory evidence that he is entitled to relief under the regulations.

¶595. Masters' certificates and discharges from the United States shipping commissioners, made out and signed in proper form, showing that the applicant for relief has been employed for 60 days of continuous service "in a registered, enrolled, or licensed vessel of the United States," a part of which time must have been during the 60 days immediately preceding his application for relief, shall entitle him to treatment. The phrase "60 days of continuous service" shall not be held to exclude seamen whose papers show brief intermissions between short services that aggregate the required 60 days, provided that any such intermission does not exceed 60 days.

¶596. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seaman on said vessel may be accepted as evidence in lieu of

the master's certificate in cases where the latter is not procurable.

¶597. Masters or owners of documented vessels of the United States shall, on demand, furnish any seaman who has been employed on such vessel a certificate of the length of time said seaman has been employed, giving the dates of such employment. This certificate will be filed at the station where application is made for relief, if relief is furnished.

¶599. Any master of a vessel or other person who shall furnish a false certificate of service with intent to procure treatment of a seaman shall be immediately reported to the nearest United States district attorney for prosecution. A person who ships for the purpose of thereby qualifying for treatment of a preexisting disability is ineligible.

¶603. Whenever a beneficiary applies for relief without a master's certificate, the oath or affirmation of the applicant as to the facts of his last employment, stating names of vessels and dates of service, may be accepted as evidence in support of his claim for relief. This oath or affirmation shall be taken before a notary or other person authorized by law to administer oaths.

¶607. When a seaman applies for relief after an absence of 60 days or more from his last vessel and it satisfactorily appears that it was impracticable for him to apply to the proper officer for treatment, or that he obtained treatment at his own expense, a statement of the facts, together with a copy of the application and other papers in support of same, shall be filed and the seamen admitted to hospital.

¶608. Any seaman who is able to write will be expected to sign his name upon the face of the master's certificate issued to him before said certificate is signed by the master of the vessel, and the officer receiving such certificate shall require the applicant to verify the signature in his presence.

¶610. When a seaman who has received continuous treatment at the out-patient office for a period of two months applies for further treatment, he must, to entitle him to treat-

ment, furnish a new certificate of service showing that he is still following his vocation as seaman, or has been prevented from resuming this occupation by reasons not under his control, giving the latest dates of services, and, in case of lack of recent service, its explanation, to appear on his record card. The medical officer in charge may waive this requirement in instances where the nature of the disability has been such as to prevent a resumption of a seaman's vocation or when the port is closed.

¶611. The expenses of caring for sick and disabled seamen incurred during a voyage, or when not pre-arranged by an authorized agent of the Government, will not be paid by the service.

¶613. In no case shall money be paid to a seaman or to his family or friends by the service as reimbursement for expenses incurred during his sickness or disability.

¶614. Seamen who may be injured in street brawls or while committing a breach of the peace, and are, therefore, confined in jail or taken to civil hospitals by the local authorities for such acts, shall not receive treatment at the expense of the service. Such seamen should, however, be furnished treatment if brought to service or contract hospital.

¶615. Seamen taken sick or injured on board or ashore while actually employed on a documented vessel shall be entitled to treatment at relief stations without reference to the length of their service.

¶616. A certificate of discharge may, at the discretion of the officer in charge be given to a hospital patient, but such certificate, when presented at another relief station, shall not be taken as sufficient evidence of the applicant's title to hospital relief, but may be considered as collateral to other satisfactory data submitted by the seaman.

¶617. Temporary relief only is contemplated, and admission to hospital is not intended to permit an indefinite residence therein for cause other than actual disease or injury. Seamen who have changed their occupation or who have retired from

their calling because of age or for any other reason not requiring relief from actual disease or injury within a period of 60 days after leaving the vessel shall not be entitled to service relief.

The United States Public Health Service maintains for the relief and hospitalization of seamen, hospitals and relief stations at the following ports, and any seamen entitled to relief under the above quoted regulations may obtain same by applying either at the hospital direct or at the out-patient office of the hospital.

LIST OF HOSPITALS AND RELIEF STATIONS

Revised to October 10, 1925

U. S. Marine Hospitals

No. 1. Baltimore, Md. (31st St. & Remington Ave.)
O.-P. Office (Custom House)
2. Boston (Chelsea), Mass. (High Street)
O.-P. Office (Custom House)
3. Buffalo, N. Y. (2183 Main Street)
O.-P. Office (228 Federal Building)
5. Chicago, Ill. (4141 Clarendon Ave.)
O.-P. Office (536 Lake Shore Drive)
O.-P. Office (Old Post Office)
O.-P. Office (Van Buren St. Station)
6. Cleveland, Ohio (1041 Lakeside Ave.)
O.-P. Office (Parcel Post Building)
7. Detroit, Mich. (E. Jefferson & Mt. Elliott Aves.)
O.-P. Office (Post Office Building)
8. Evansville, Ind. (1700 West Illinois Street)
9. Fort Stanton, N. M. (PHS TB Sanatorium)
Freight and express address: Capitan, N. M.
10. Key West, Fla. (Front & Emma Streets)
11. Louisville, Ky. (Portland Ave. & 22nd Street)
O.-P. Office (Custom House)

12. Memphis, Tenn. (Delaware & California Streets)
13. Mobile, Ala. (St. Anthony & Bayou Streets)
    O.-P. Office (O'Gwynn Building)
14. New Orleans, La. (Tchoupitoulas & Henry Clay)
    O.-P. Office (Custom House)
15. Pittsburgh, Pa. (40th Street & Penn Ave.)
    O.-P. Office (Federal Building)
16. Portland, Me. (Woodford's Station)
    O.-P. Office (Custom House)
17. Port Townsend, Wash. (Franklin & Quincy)
18. St. Louis, Mo. (3640 Marine Ave.)
    O.-P. Office (Old Custom House)
19. San Francisco, Calif. (14th Ave. & Lake)
    O.-P. Office (Appraiser's Bldg.)
20. Savannah, Ga. (York & Abercorn Streets)
21. Stapleton, N. Y. (Bay Street) Staten Island, N. Y.
22. Vineyard Haven, Mass.
43. Ellis Island, N. Y.
66. Carville, La. (PHS Leprosarium)
70. New York, N. Y. (67 Hudson Street)
    O.-P. Office (Barge Office)
    O.-P. Office (P. O. Bldg., 34th & 7th Ave.
    O.-P. Office (Seamen's Church Institute of N. Y., 25 South Street)
82. Norfolk, Va. (Hampton Bvd., Larchmont)
    O.-P. Office (Custom House)

RELIEF STATIONS—Second Class

No. 204. Astoria, Oregon (408 Spexarth Building)
301. Balboa Heights, Canal Zone
352. El Paso, Texas (321 Mills Building)
245. Galveston, Texas (302 Custom House)
254. Honolulu, T. H. (Federal Building)
266. Los Angeles, Calif. (544 Wilcox Building)
270. Manila, P. I. (Custom House—P. O. Box 424)

305. Philadelphia, Pa. (410 Chestnut Street)
309. Port Arthur, Texas (Federal Building)
314. Providence, R. I. (403 Federal Building)
319. St. Thomas, V. I. (47 Norre Gade)
323. San Diego, Calif. (306 Federal Building)
326. San Juan, P. R. (P. O. Box 366)
347. Miami, Fla. (City Hall)
355. San Pedro, Calif. (111 West Seventh Street)
329. Seattle, Wash. (3130 Arcade Building)
339. Washington, D. C. (P. O. Dept. Building, 12th & Penna. Ave.)
360. Washington, D. C. (F Bldg., 7th St., N. W.) (Dental Clinic)

RELIEF STATIONS—Third Class

No. 255. Aberdeen, Wash. (Electric Building)
200. Albany, N. Y. (252 State Street)
203. Ashtabula, Ohio (38 Centre Street)
207. Bangor, Me. (217 State Street)
209. Beaufort, N. C. (Potter Building)
210. Bellingham, Wash. (303 Medical Building)
212. Biloxi, Miss. (1061 W. Howard Avenue)
213. Boothbay Harbor, Me. (2 Commercial Street)
217. Brunswick, Ga. (Glynn County Bank Bldg.)
219. Burlington, Iowa (Iowa State Bank Bldg.)
220. Cairo, Ill. (808 Commercial Avenue)
227. Calais, Me. (281 Main Street)
221. Cambridge, Md. (22 Race Street)
223. Cape May, N. J. (115 Ocean Street)
224. Charleston, S. C. (Custom House)
226. Cincinnati, Ohio (628 Elm Street)
229. Cordova, Alaska
230. Crisfield, Md. (Professional Building)
234. Duluth, Minn. (329 Bradley Building)
236. Eastport, Me. (34 Boynton Street)

237. Edenton, N. C.
238. Elizabeth City, N. C. (Kramer Building)
239. Erie, Pa. (804 Peach Street)
240. Escanaba, Mich. (1215 Ludington Street)
241. Eureka, Calif. (407 First National Bank Bldg.)
235. Everett, Wash. (302 Central Building)
243. Fall River, Mass. (1244 Pleasant Street)
244. Gallipolis, Ohio (538 Second Ave.)
246. Georgetown, S. C. (Fraser Street)
247. Gloucester, Mass. (139 Main Street)
248. Grand Haven, Mich. (220 Washington St.)
249. Green Bay, Wis. (208 Bellin Building)
250. Gulfport, Miss. (21 Durham Building)
251. Hancock, Mich. (Kauth Block)
359. Houston, Texas (511 Kress Building)
258. Jacksonville, Fla. (St. James Building)
260. Juneau, Alaska (First National Bank Building)
262. Ketchikan, Alaska (Koel Building)
263. Kodiak, Alaska
264. La Crosse, Wis. (412 Linker Building)
242. Lee Hall, Va. (On board SS. *City of Elwood*, Laid-up Steel Fleet)
265. Lewes, Delaware
346. Little Rock, Ark. (513 Donaghey Building)
268. Ludington, Mich. (First National Bank Building)
269. Machias, Maine
271. Manistee, Mich. (427 River Street)
272. Manitowoc, Wis. (811 York Street)
273. Marquette, Mich. (313 High Street)
274. Marshfield, Ore. (Irving Building)
277. Menominee, Mich. (Electric Square Building)
278. Milwaukee, Wis. (516 Federal Building)
282. Nantucket, Mass. (31 Center Street)
283. Nashville, Tenn. (501 Hitchcock Building)
284. Natchez, Miss. (Natchez Sanatorium, 306 Franklin Street)

285. New Bedford, Mass. (11 North Orchard Street)
286. New Bern, N. C. (St. Luke's Hospital)
288. New Haven, Conn. (1187 Chapel Street)
289. New London, Conn. (205 William Street)
291. Newport, Ark. (Jones Building)
292. Newport, Ore. (Hurlburt Street)
293. Newport, R. I. (98 Mill Street)
294. Newport News, Va. (118 26th Street)
295. Nome, Alaska
297. Ogdensburg, N. Y. (430 Ford Street)
298. Oswego, N. Y. (65 West Bridge Street)
300. Paducah, Ky. (507 City National Bank Building)
306. Panama City, Fla.
302. Pensacola, Fla. (311 Blount Building)
303. Perth Amboy, N. J. (Custom House)
307. Ponce, P. R. (Custom House)
308. Port Angeles, Wash. (116 Laurel Street)
310. Port Huron, Mich. (Federal Building)
312. Portland, Ore. (320 Park Building)
315. Provincetown, Mass. (234 Commercial Street)
316. Richmond, Va. (9 West Grace Street)
317. Rock Island, Ill. (Rock Island Arsenal)
318. Rockland, Me. (400 Main Street)
324. Sandusky, Ohio (Commercial Bank Building)
327. Sault Ste. Marie, Mich. (Federal Building)
331. Sheboygan, Wis. (707 North 8th Street)
328. Sitka, Alaska
332. Solomons, Maryland
334. South Bend, Wash. (Lumber Exchange Building)
361. Southport, N. C. (Morrison Building)
335. Superior, Wis. (Columbia Building)
345. Tacoma, Wash. (930 Rust Building)
336. Tampa, Fla. (212 Citizen's Bank Building)
337. Toledo, Ohio (410 Colton Building)
338. Vicksburg, Miss. (1503 Washington Street)
340. Washington, N. C. (519 West Main Street)

341. White Stone, Virginia
362. Wilmington, Del. (907 Tatnall Street)
342. Wilmington, N. C. (203 Murchison Building)

RELIEF STATIONS—Fourth Class

In Charge of Deputy Collectors of Customs

No. 201. Apalachicola, Fla.
202. Ashland, Wis.
348. Bath, Me.
208. Bay City, Mich.
349. Beaufort, S. C.
215. Bridgeport, Conn.
350. Chattanooga, Tenn.
351. Ellsworth, Me.
252. Hartford, Conn.
304. Petersburg, Alaska
356. Portsmouth, N. H.
353. Reedville, Va.
320. Saginaw, Mich.
354. Salem, Mass.
357. Unalaska, Alaska
343. Wrangell, Alaska

Medical Officers will be advised from time to time as to changes in hospitals and relief stations.

In all official correspondence the station name, number, street address (if any), city and state, should appear.

EXCERPTS FROM U. S. NAVIGATION LAWS, 1919

CREW ACCOMMODATIONS

Mar. 2, 1895. (a) The tonnage of the spaces or compartments occupied by or appropriated to the use of the crew of the vessel. Every place appropriated to the crew of the vessel shall have a space of not less than seventy-two cubic feet and not less than twelve superficial feet, measured on the deck or floor of that place for each seaman or apprentice lodged therein. The provisions of this Act requiring a crew space of seventy-two cubic feet per man shall apply only to vessels the construction of which shall be begun after June thirtieth, eighteen hundred and ninety-five. Such place shall be securely constructed, properly lighted, drained and ventilated, properly protected from weather and sea, and as far as practicable properly shut off and protected from the effluvium of cargo or bilge water; and failure to comply with this provision shall subject the owner to a penalty of five hundred dollars. Every place so occupied shall be kept free from goods or stores of any kind not being the personal property of the crew in use during the voyage; and if any such place is not so kept free the master shall forfeit and pay to each seaman or apprentice lodged in that place the sum of fifty cents a day for each day during which any goods or stores as aforesaid are kept or stored in the place after complaint has been made to him by any two or more of the seamen so lodged.

Mar. 3, 1897. Sec. 2. Mar. 4, 1915. Sec. 6. (Effective beginning Nov. 4, 1915) On all merchant vessels of the United States the construction of which shall be begun after the passage of this Act, except yachts, pilot boats, or vessels of less than one hundred tons register, every place appropriated to the crew of the vessel shall have a space of not less than one hundred and twenty cubic feet and not less than sixteen square feet, measured

on the floor or deck of that place, for each seaman or apprentice lodged therein, and each seaman shall have a separate berth and not more than one berth shall be placed above another; such place or lodging shall be securely constructed, properly lighted, drained, heated and ventilated, properly protected from weather and sea, and, as far as practicable, properly shut off and protected from the effluvium of cargo or bilge water. And every such crew space shall be kept free from goods or stores not being the personal property of the crew occupying said place in use during the voyage.

That in addition to the space allotment for lodgings hereinbefore provided, on all merchant vessels of the United States which in the ordinary course of their trade make voyages of more than three days' duration between ports, and which carry a crew of twelve or more seamen, there shall be constructed a compartment suitably separated from other spaces, for hospital purposes, and such compartment shall have at least one bunk for every twelve seamen, constituting her crew, provided that not more than six bunks shall be required in any case.

All merchant vessels of the United States, the construction of which shall be begun after the passage of this act having more than ten men on deck must have at least one light, clean and properly ventilated washing place. There shall be provided at least one washing outfit for every two men of the watch. The washing place shall be properly heated. A separate washing place shall be provided for the fire-room and engine-room men, if their number exceed ten, which shall be large enough to accommodate at least one-sixth of them at the same time, and have hot and cold water supply and a sufficient number of wash basins, sinks, and shower baths.

Any failure to comply with this section shall subject the owner or owners of such vessel to a penalty of not less than $50 nor more than $500: Provided, that forecastles shall be fumigated at such intervals as may be provided by regulations to be issued by the Surgeon-General of the Public Health Service, with

the approval of the Department of Commerce, and shall have at least two exits, one of which may be used in emergencies.

LOG BOOK

R. S., 4290.

Every vessel making voyages from a port in the United States to any foreign port, or being of the burden of seventy-five tons, or upward, from a port on the Atlantic to a port on the Pacific, or vice versa, shall have an official log-book; and every master of such vessel shall make, or cause to be made therein, entries of the following matters, that is to say:

Fifth.—Every case of illness or injury happening to any member of the crew, with the nature thereof, and the medical treatment.

Sixth.—Every case of death happening on board, with the cause thereof.

WARMTH AND CLOTHING

R. S. 4572. Dec. 21, 1898. Sec. 15.

Every vessel bound on any foreign voyage exceeding in length fourteen days shall also be provided with at least one suit of woolen clothing for each seaman, and every vessel in the foreign or domestic trade shall provide a safe and warm room for the use of seamen in cold weather. Failure to make such provision shall subject the owner or master to a penalty of not less than one hundred dollars. (This section shall not apply to fishing or whaling vessels or yachts. December 21, 1898, sec. 26.)

MEDICINES AND ANTISCORBUTICS

Every vessel belonging to a citizen of the United States, bound from a port in the United States to any foreign port, or being of the burden of seventy-five tons or upward, and bound from a port on the Atlantic to a port on the Pacific, or vice versa, shall be provided with a chest of medicines; and every sailing-vessel bound on a voyage across the Atlantic or Pacific Ocean, or around Cape Horn, or the Cape of Good Hope, or engaged in the whale or other fisheries or in sealing, shall also be provided with, and cause to be kept, a sufficient quantity of lime or lemon juice, and also sugar and vinegar, or other anti-scorbutics, to be served out to every seaman as follows: The master of every such vessel shall serve the lime or lemon juice, and sugar and vinegar, to the crew, within ten days after salt provisions mainly have been served out to the crew, and so long afterward as such consumption of salt provisions continues; the lime or lemon juice and sugar daily at the rate of half an ounce each per day; and the vinegar weekly at the rate of half a pint for each member of the crew.

If, on any such vessel, such medicines, medical stores, lime or lemon juice, or other articles, sugar, and vinegar, as are required by the preceding section, are not provided and kept on board, as required the master or owner shall be liable to a penalty of not more than five hundred dollars; and if the master of any such vessel neglects to serve out the lime or lemon juice, and sugar and vinegar in the case and manner directed, he shall for each such offense be liable to a penalty of not more than one hundred dollars; and if any master is convicted in either of the offenses mentioned in this section, and it appears that the offense is owning to the act or default of the owner, such master may recover the amount of such penalty, and the costs incurred by him, from the owner.

SCALE OF PROVISIONS TO BE ALLOWED AND SERVED OUT TO CREW DURING THE VOYAGE

		Sun.	Mon.	Tues.	Wed.	Th'r	Fri.	Sat.
R. S. 4612,	Water.....qts.	5	5	5	5	5	5	5
Dec. 21, 1898.	Biscuit.....lbs.	½	½	½	½	½	½	½
Sec. 23,	Beef, salt.....lbs.	.....	.....	1¼	.....	1¼	.....	1¼
Mar. 4, 1915.	Pork, salt.....lbs.	.....	1	.....	1	.....	1	.....
Sec. 10.	Flour.....lbs.	½	.....	½	.....	½	.....	.....
	Canned meat...lbs.	1	.....	.....	1	.....	.....	.....
	Fresh bread.....lbs.	1½	1½	1½	1½	1½	1½	1½
	Fish, dry, pres. or fresh.....lbs.	.....	.....	.....	.....	.....	1	.....
	Potatoes or yams.....lbs.	1	1	1	1	1	1	1
	Canned tomatoes.....lb.	½	.....	.....	.....	.....	½	.....
	Peas.....pt.	.....	.....	⅓	.....	.....	⅓	.....
	Beans.....pt.	.....	⅓	.....	⅓	.....	.....	.....
	Rice.....pt.	.....	⅓	.....	.....	.....	.....	½
	Coffee (green berry).....oz.	¾	¾	¾	¾	¾	¾	¾
	Tea.....oz.	⅛	⅛	⅛	⅛	⅛	⅛	⅛
	Sugar.....oz.	3	3	3	3	3	3	3
	Molasses.....pt.	½	.....	½	.....	½	.....	.....
	Dried fruit.....oz.	3	.....	3	.....	3	.....	.....
	Pickles.....pt.	.....	¼	.....	¼	.....	¼	.....
	Vinegar.....pt.	.....	.....	½	.....	.....	.....	½
	Corn Meal.....oz.	4	.....	.....	.....	4	.....	.....
	Onions.....oz.	4	.....	.....	.....	4	.....	4
	Lard.....oz.	1	1	1	1	1	1	1
	Butter.....oz.	2	2	2	2	2	2	2
	Mustard, pepper and salt sufficient for seasoning.....							

SUBSTITUTES

One pound of flour daily may be substituted for the daily ration of biscuit or fresh bread; two ounces of desiccated vegetables for one pound of potatoes or yams; six ounces of hominy, oatmeal, or cracked wheat, or two ounces of tapioca, for six ounces of rice; six ounces of canned vegetables for one-half pound of canned tomatoes; one-eighth of an ounce of tea for three-fourths of an ounce of coffee; three-fourths of an ounce of coffee for one-eighth of an ounce of tea; six ounces of canned fruit for three ounces of dried fruit; one-half ounce of lime juice for the daily ration of vinegar; four ounces of oatmeal or cracked wheat for one-half pint of cornmeal; two ounces of pickled onions for four ounces of fresh onions.

When the vessel is in port and it is possible to obtain the same, one-and-one-half pounds of fresh meat shall be substituted for the daily rations of salt and canned meat; one-half pound of green cabbage for one ration of canned tomatoes; one-half pound of fresh fruit for one ration of dried fruit. Fresh fruit and vegetables shall be served while in port if obtainable. The seamen shall have the option of accepting the fare the master may provide, but the right at any time to demand the foregoing scale of provisions. The foregoing scale of provisions shall be inserted in every article of agreement, and shall not be reduced by any contract, except as above, and a copy of the same shall be posted in a conspicuous place in the galley and in the forecastle of each vessel. (Fishing or whaling vessels or yachts exempt—December 21, 1898, sec. 26.)

Sick and Disabled Seamen

The President is authorized to receive donations of real or personal property, in the name of the United States, for the erection or support of hospitals for sick and disabled seamen.

The term "seaman," wherever employed in legislation relating to the marine-hospital service, shall be held to include any person employed on board in the care, preservation, or navigation of any vessel, or in the service, on board, of those engaged in such care, preservation, or navigation.

No person employed in or connected with the navigation, management, or use of canal-boats engaged in the coasting-trade shall by reason thereof be entitled to any benefit or relief from the marine-hospital fund.

Sick and disabled seamen of foreign vessels and of vessels (not subject to hospital-dues) may be cared for by the marine-hospital service at such rates and under such regulations as the Secretary of the Treasury may prescribe.

The following form, 1915, must be furnished by the master or authorized agent of vessel to a seaman desiring to make application to a relief station of the U. S. Public Health Service for examination or treatment. Blanks may be secured upon application to the nearest relief station.

TREASURY DEPARTMENT,
U. S. PUBLIC HEALTH SERVICE.
Form 1915
F. C., Nov. 4-16.

MASTER'S CERTIFICATE OF SERVICE OF SICK OR INJURED SEAMEN

.....
(Place.)

....., 191

To whom it may concern:

I CERTIFY, on honor, that....., whose signature and description appear below, has been employed on board in the care, preservation, or navigation of the .....
(Name and class of vessel.)
.....of.....,
(Home port, where permanent document issues.)
or in the service, on board, of those engaged in the care, preservation, or navigation of said vessel, from the.....day of....., 191 , to the.....day of....., 191 . I, further certify that the person named herein has, in my presence, signed his name in the blank space provided below for that purpose.

.....
Master of the above-named vessel.

Signature of the person named above.....
Nativity....., age.....years, height....feet....inches, color of eyes....., color of hair....., distinguishing marks:.....
.....
Previous service.....
.....
Total service on U. S. vessels .....years .....months.

INSTRUCTIONS

1. If the seaman is unable to write, his mark should be witnessed by the master or authorized agent of the vessel.

2. The medical officer, or attending physician, should compare the seaman's signature with that given in the certificate, as a means of identification.

NOTICE.—This certificate must be signed by the Master or Authorized Agent of the Vessel. Any person defrauding the United States by forging signatures or gaining admission to a hospital when not a seaman will be prosecuted and punished according to sections 5418, 5421, or 5438, Revised Statutes.

FIRST AID BY RADIO

In 1921, through the efforts of the Seamen's Church Institute of New York, in cooperation with the United States Public Health Service, the Radio Corporation of America undertook to furnish *free of charge* radio medical advice for the benefit of sick and injured persons on ships at sea. At first this service was furnished to American ships only, but later was extended to all vessels regardless of nationality.

In addition to the marine coastal stations furnishing this service, all vessels served or controlled by the Radio Corporation of America and the United Fruit Company, or the Tropical Radio Telegraph Company, will assist in the transmission of messages, or if carrying a doctor, will furnish radio medical advice—all without charge of any kind.

The service has proven of immense value and as time goes on calls for medical advice have become more and more frequent, and without a doubt, the saving of a number of lives and the relief of a vast amount of suffering may be attributed to it.

Medical radiograms are given preference by the Radio Corporation of America and the stations of the United Fruit Company, or Tropical Radio Telegraph Company, over all others, excepting distress calls. *There is no charge whatever either for the medical advice furnished or for the radio service in connection therewith.*

The following radio stations are at all times ready to furnish medical advice:

Radiomarine Corporation of America Stations

Chatham, Mass.	WCC
Chatham, Mass.	WIM
New York, N. Y.	WNY
Tuckerton, N. J.	WSC
San Francisco, California	KPH

Los Angeles, California.....KSE
Galveston, Texas .....WGV
East Moriches, Long Island.....WSH
New London, Conn. .....WSA
Palm Beach, Florida.....WOE
Port Arthur, Texas.....WPA

United Fruit Company, or Tropical Radio Telegraph Company Stations

Boston, Mass. .....WBF
Miami, Florida .....WAX
New Orleans, La. .....WNU
Fort Morgan, Alabama.....WIO
Mobile, Alabama .....WNN
Santa Marta, Colombia..... UJ
Tegucigalpa, Honduras ..... UG
Puerto Barrios, Guatemala..... UF
Managua, Nicaragua ..... UL
Bluefields, Nicaragua ..... UQ
Cape Gracias, Nicaragua..... UW
Puerto Limon, Costa Rica..... UX
Almirante, Panama .....RXA

Also:

Tela Railroad Company's station at Tela, Honduras .....UC
Truxillo Railroad Company's station at Puerto Castilla, Honduras.....UA
Station of the Compania Radiografica Internacional de Costa Rica, at Cartago, C. R. .....UR
Chirigui Land Company's station at Pto Armuelles, Republic of Panama.....UY

(These last mentioned stations may be reached direct or through any station of the United Fruit Company, or of the Tropical Radio Telegraph Company.)

Bergen Radio, Norway...LGN
Goteborg Radio, Sweden..SAB
Flekkeroy, Norway .....LDF

{ Requests on these two stations may be made in Norwegian, Danish, Swedish, German, English or French Language.

Radio Corporation of the Philippines, Manila, P. I...KZRC

When sending radiograms pertaining to medical advice, operators should indicate the number of words in the message and use the prefix "DH MEDICO."

Messages requesting medical advice should be signed by the Master of the vessel and should briefly but clearly state the symptoms shown by the afflicted person.

The following suggestions will aid in properly preparing radiograms of this nature:

The individual sending the message must remember that the physician called upon for advice by radio can see the patient only through the eyes of the sender of the message and that he must draw all his conclusions regarding the condition of the patient and the treatment to be rendered from the picture given in the radio message.

It is very important therefore to include all the outstanding features noted, which may possibly have a bearing on the case.

It may be necessary for the physician to have any or all the following facts in order to arrive at a correct conclusion regarding the illness or injury and to prescribe the proper treatment.

Consider the list below, observe the sick man carefully and prepare the radiogram accordingly.

1. Age of patient
2. General appearance—robust—puny—pale—ruddy
3. How long ill—hours—days—weeks
4. Beginning of illness—sudden or gradual
5. Symptoms of illness at beginning—Backache—constipation — chills — cramps — diarrhea — delirium — dizziness—headache—fever—nausea — pain — shortness of breath —spitting of blood—vomiting—vomiting of blood—unconsciousness, etc.
6. Symptoms during course of illness—Practically the same as for symptoms of illness at beginning (5)
7. Temperature at beginning of illness

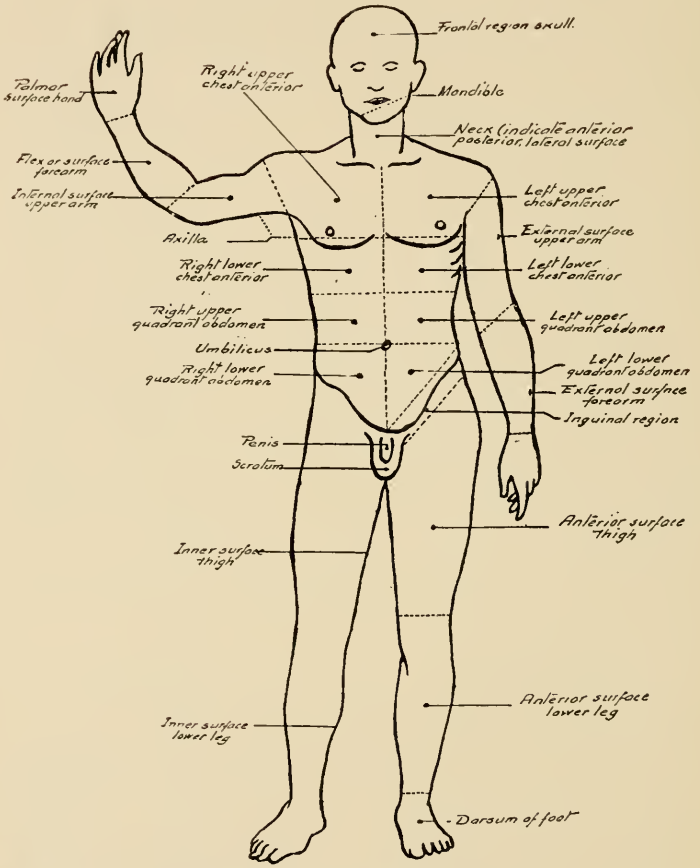


FIG. 35.—To be used as an aid in indicating location of pain, etc. when requesting Radio Medical Advice.

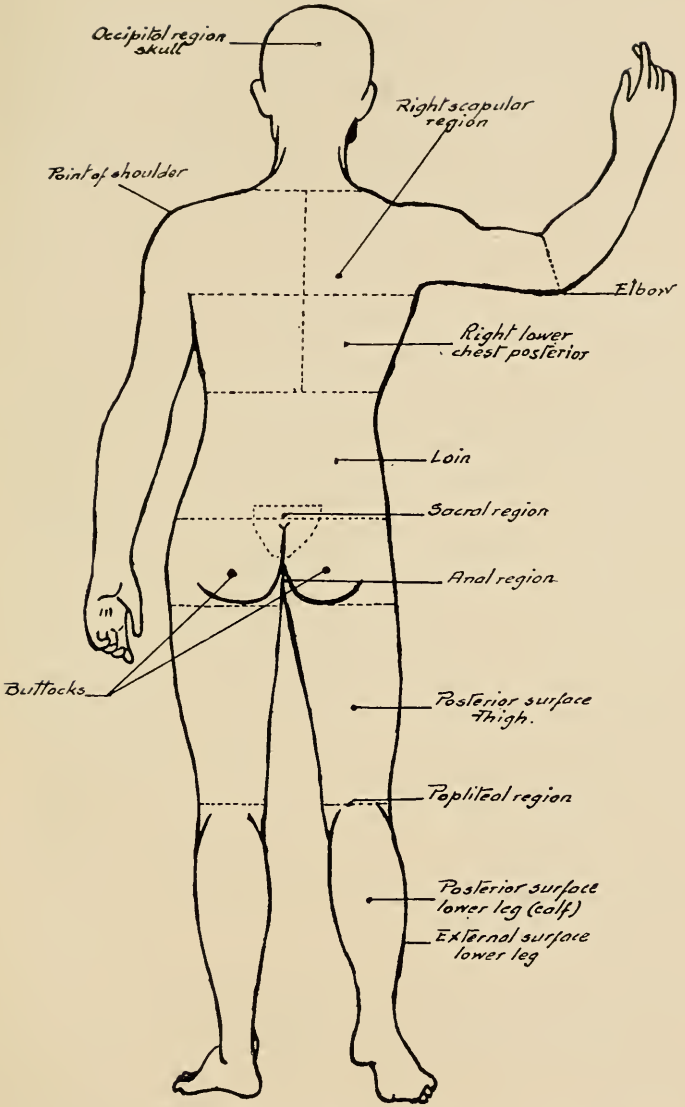


FIG. 36.—To be used as an aid in indicating location of pain, etc. when requesting Radio Medical Advice.

8. Temperature during illness

9. Temperature, Type of—High—low—continuous high—continuous low (high evening, low morning)

10. Pain, Type of — Sharp — dull — aching — continuous —intermittent—increased by pressure—not increased by pressure—relieved by taking food—aggravated by taking food—not affected by taking food—increased by taking deep breath, etc.

11. Pain, Location of—Locate as exactly as possible using accompanying charts. Figure 35 or 36 to aid in indicating location

12. Tenderness (different from pain as it is only felt on pressure) location—on deep pressure—on superficial pressure

13. Swellings—Hard—soft—location of—size

14. Tumors—Appearance—size—location

15. Skin, Changes in—dry—moist—sweating—color of—jaundice

16. Skin Eruptions—Appearance of—Papular—vesicular—pustular (see glossary for definitions)

17. Eyes—Appearance of—bloodshot—dilated pupil—contracted pupil

18. Tongue—Appearance of—coated—color of coating

19. Pulse—Rate of, per minute—strong—weak—regular—irregular

20. Respiration—Rate of, per minute—easy—labored

21. Gums—Appearance of—firm—spongy—bleeding

22. Breath—Odor of—sweetish—foul

23. Abdomen — Condition of — distended—flat—tender—muscle rigidity equal on both sides (see explanation of rigidity of abdominal muscles under appendicitis)

24. Paralysis—Part affected

25. Appetite

26. Weight—Emaciated—robust—losing

27. Sputum—Appearance of—amount—odor

28. Urine—Amount—appearance of

29. Stools—Number of, in any given time—appearance—blood in stool
30. Give any other signs or symptoms which it is believed might have a bearing on case
31. Medicine—what given—quantity—effect
32. What has been done for patient

Medical advice will be phrased in language intelligible to a layman.

The following are examples of properly constructed messages which have been received requesting advice:

S.S.——————————"DH MEDICO"
Man age 24—ill suddenly—2 days
Began nausea, vomiting, temperature 102.5 continuous
Sharp pain region umbilicus—tender abdomen on deep pressure right side—Tongue heavy white coat—abdomen distended
Stools 2—Gave castor oil—Request advice

All the data for making a diagnosis of probable appendicitis was contained in above message.

S.S.——————————"DH MEDICO"
Man age 34—ill 2 days with cold—sudden chill—severe pain in right lower chest—temperature 103.5—continuous—blisters about lips—Pulse 120 strong—Respiration 36 per minute labored—Sputum brownish red—sticky—Gave aspirin 2 tablets 4 hourly—no effect—still severe pain chest—shortness of breath

From this radio message the physician correctly diagnosed pneumonia.

S.S.——————————"DH MEDICO"
Man age 52 suddenly fell unconscious on deck—no injury—regained partial consciousness 4 hours—delirium—

temperature 99.5—eyes crossed—does not move right leg —urine—stool both passed in bed. What shall I do?

The above case was correctly diagnosed as apoplexy.

Other examples of properly constructed messages might be quoted but it can be seen from the above that it is important to give all the facts noted about the sick person. Contrast the above messages with the following which have also been received requesting advice. Even the layman will readily see the difficulty of properly diagnosing these cases and prescribing medical advice from the facts given.

Man ill temperature 102.5 complains backache, headache and fever, pain in chest, think he has pneumonia. Request advice

From the facts given in this message no diagnosis could be made and no treatment prescribed.

Man taken ill suddenly—cramps in abdomen for 2 days. Has fever—gave castor oil—no better. Request advice.

This message is equally vague and unsatisfactory.

GLOSSARY

(Explanation of Medical Terms)

Abdomen.—Belly.

Abscess.—A local collection of pus.

Acid.—Sour (see Alkali).

Acute.—Sharp, sudden, usually severe. Not chronic.

Adhesive.—Sticking plaster of large size, used to hold dressings in place, and also wound edges together till healing takes place.

Alkali.—Opposed to acid. Acids and alkalies have certain definite chemical qualities. They neutralize each other. Vinegar is an acid. Lye is an alkali.

Amoeba.—Plural amoebae. Very small living parasites. Some cause disease.

Anatomy.—The science which deals with the structure of the body.

Anesthesia.—Loss of feeling.

General Anesthesia.—Sleep under ether or chloroform.

Local Anesthesia.—Production of loss of feeling in a part.

Anopheles.—A type of mosquito. (Carrier of malaria.)

Anthrax.—An acute, often fatal, infectious disease, due to the anthrax germ.

Antidote.—A remedy for counteracting a poison and stopping its action.

Antiscorbutic.—A substance, usually a food, used to prevent scurvy.

Antiseptic.—A substance which will prevent the growth of germs.

Artificial Respiration.—Artificial breathing.

Bacteria.—Very minute forms of vegetable life which can be seen only with the microscope. Germs.

Bladder.—The organ which holds urine, located in the belly.

Blood Clot.—Blood which, exposed to air, becomes solid.

Bowel.—(See Anatomy, Part IV.) Intestine, gut.

Brachial.—Referring to that part of the arm from the shoulder to the elbow.

Bubo.—Swollen glands.

Bubonic.—Having buboes or swellings of glands, as in groin.

Burrow.—To penetrate, to perforate, to force through.

Buttocks.—The rump; projections on which one sits.

Caffein.—A drug used as a heart stimulant.

Capillary.—A very fine blood vessel, too small to see.

Capsule.—A small case made of gelatin for holding drugs, like a pill.

Cathartic.—A substance which, when taken by mouth, causes a movement of the bowels.

Caustic.—A drug which burns and destroys soft tissues like skin.

Cauterize.—To burn.

Centigrade Thermometer.—One in which freezing temperature is 0 degrees, and boiling is 100 degrees.

Charring.—To burn black.

Clavicle.—The collar bone.

Clinical (Record).—Record of occurrences during illness.

Clinical Thermometer.—A thermometer used to take the temperature of a human being.

Colic.—Cramp-like pains, especially over the bowels.

Collapse.—Extreme prostration and depression with failure of the circulation.

Comminuted.—Splintered, broken into small pieces.

Commode.—A box or seat and bucket into which stool or urine can be passed.

Communicable Disease.—One which can be communicated (given) from one person to another.

Compress.—A wad of gauze or cotton, dry or moist, applied over wounds or over pain.

Confluent.—Flowing together.

Constipated.—Condition in which the bowels do not move freely.

Constitutional.—Through the whole system.

Contagious (disease).—One that is spread by direct contact.

Contamination.—To become dirty by touching.

Contused.—Bruised.

Counter Irritant.—A drug applied to the skin to produce redness.

Cramps.—Sharp pains which come and go, due to spasm of muscles.

Crepitus.—A grating sensation which can be felt when broken ends of bones are rubbed together.

Cuddy.—A small and closed space like a little room.

Cyanide Gas.—Also called hydrocyanic acid gas. A very poisonous gas used in disinfection.

Delirium.—Condition in which patient is said to be "out of his head."

Denatured alcohol.—Alcohol to which something has been added to prevent internal use.

Diagnosis.—The act of distinguishing one disease from another.

Digestion.—The process of preparing food taken into the body for use by the body.

Dilute.—Not strong.

Disinfectant.—A substance which will kill disease germs.

Disinfection.—The destruction of germs.

Disinfestation.—Getting rid of vermin.

Dispensary.—Room or place where drugs are issued or where out-patients are treated.

Distended.—Filled—enlarged.

Distill.—To change a fluid into steam, by heat, and then again condense into pure fluid.

Douche.—The use of water or medicated water for cleansing wounds, or body cavities, applied with some force through a form of syringe.

Dutch Oven.—A shallow iron oven or pot in which sulphur is burned during fumigation.

Effluvium.—A foul smell given off from decaying matter, or other sources.

Elicit.—To bring forth.

Epidemic.—Condition in which there are a great many cases of a disease.

Epileptic.—A person who is subject to fits.

Eruption.—A "breaking out," as on the skin or mucous membrane.

Excretion.—That which is thrown out of the system, like urine or sweat.

Extension.—To straighten out; to pull.

Fahrenheit Thermometer.—One in which freezing temperature is 32 degrees and boiling is 212 degrees.

Fever.—Greater temperature than normal.

Filter.—A device for straining water.

Fleeced.—Cheated.

Forceps.—An instrument with two blades for grasping and holding.

Fracture.—A break.

Fumigation.—The exposure to gases or fumes (usually with the idea of killing vermin and germs).

Fungus.—(Plural Fungi). Low form of animal life which comprises the molds, toadstools, etc.

Gangrene.—Local death of a part.

Gauze.—A very thin cloth used for wound dressings.

Genital Organs.—Penis, scrotum, testicles, etc.

Germ.—A minute living particle. Some of them when grown in the body cause disease.

Glands.—Organs of various kinds. Lymph glands are small bodies in groins, armpits and elsewhere, which swell when infected.

Groin.—The fold between the body and the thigh. One on each side.

Hemorrhage.—To bleed.
Humerus.—The bone which extends from shoulder to elbow.
Hydrocyanic Gas.—See Cyanide Gas.
Hygiene.—The science of health and its preservation.
Hypodermic.—Under the skin.

Immerse.—To dip entirely, as in water.
Incise.—To cut.
Incubation period.—The time it takes a disease to develop after exposure to it.
Infected.—Containing the germs of disease.
Infection.—The growth of germs sometimes with the formation of pus.
Infectious (disease).—A disease caused by parasites such as germs. A disease which may be carried from one to another.
Infested.—With vermin. The presence of vermin on a person or in a place.
Injunctions.—Urgent instructions.
Inoculation.—The introduction of any substance, living or dead, into the flesh or under the skin, by means of a hypodermic needle.
Intestine.—The bowel.
Isolate.—To separate. To place alone.

Jaundice.—Yellowness of skin and eyes.

Kidneys.—Two glands which form urine, one on each side in the belly.

Laceration.—A tear. (A torn wound.)
Larvae (mosquito).—The young of mosquitoes (wigglers).
Lavatory.—A place for washing.

Ligaments.—Tough fibrous bands connecting bones or supporting soft tissues.

Ligate.—To tie off, as a blood vessel.

Ligature.—A thread for tying a vessel.

Manipulate.—To work with the hands; to move.

Mastoid.—A bone of the skull which lies behind the external ear. It is of cellular structure and frequently the seat of disease.

Mucous Membrane.—The reddish lining of all body cavities which communicate with the air, as the mouth.

Nausea.—"Sick at stomach." Desire to vomit.

Neutralize.—To make neutral or inactive as by adding an acid to an alkali.

Nits.—The eggs of lice, very small white, roundish bodies.

Oozing.—Very slowly flowing.

Organism.—An individual form of life constituted to carry on the activities of life. An animal or plant.

Papular.—Composed of papules, which are small, round elevations on the skin.

Paraffined.—Dipped into or coated with a paraffine, a sort of wax, which melts with heat.

Pathogenic.—Having the power to produce disease.

Pernicious.—Very injurious, likely to hurt or kill.

Petroleum.—Crude oil as it comes from the well.

Physiology.—The science that deals with the functioning of the different parts of the body.

Plague.—Bubonic plague. An epidemic and highly fatal disease due to a germ.

Pockmark.—The mark or scar left on the skin from a previous attack of smallpox.

Pox.—A term used to designate smallpox or syphilis (great pox).

Pratique.—Permission given to a ship that has satisfied the Health Regulations to hold intercourse with a port.

Prevalence.—To be present and extend widely.

Primary.—First.

Prophylaxis.—The prevention of disease.

Protozoan.—(Plural Protozoa). A low form of animal life.

Purgation.—The process of purging. Causing free bowel movement.

Purgative.—A medicine which causes the bowels to move.

Pus.—The creamy discharge which occurs in a wound that is infected.

Pustule.—A pimple of large size which contains pus.

Putrefy.—To rot.

Pyorrhea.—A condition in which the gums shrink and the roots of the teeth are exposed with the formation of pus along the gum line.

Quack.—A man who makes false claims of medical skill or knowledge.

Radius.—One of the bones of the forearm, extending from elbow to wrist.

Rectal.—Pertaining to the rectum, which is the last few inches of the intestine ending in the anus, or outlet of the bowel.

Rectum.—The lower end of the gut through which the stool is expelled.

Relax.—To make loose, slacken.

Restoration.—Bringing back.

Retching.—Attempts at vomiting without results.

Retention of Urine.—Condition in which the urine remains in the bladder and can not be forced out.

Rupture.—To break through.

Saliva.—Spit (spittle).

Sanitary.—In accord with health, healthful.

Sanitation.—The establishment of conditions favorable to health.

Secretion.—Any material separated out from the blood by an organ. For example: The urine which is separated out by the kidneys.

Septicemic.—Relating to septicemia or blood poisoning.

Serum.—The fluid part of the blood, in which the blood corpuscles float.

Shamming.—Pretending, faking.

Sloughing.—The separation of dead tissues from the living, when destruction of tissues takes place, as after a crushing injury.

Smearing.—Spreading out in a thin layer.

Solution.—The state of being dissolved, as salt in water.

Sputum.—What is spit up from the mouth, throat, or lungs.

Status.—State or condition.

Stegomyia Fasciata.—A kind of mosquito which carries yellow fever.

Sterile.—Free of all germ life.

Sterilization.—The process of killing all germs.

Still.—The apparatus by means of which distillation is carried on.

Stimulate.—To produce activity or quicken and strengthen action, as of the heart.

Stools.—Material passed from the bowel.

Strangulated.—Condition in which a part is pinched or constricted.

Sulphur Dioxide.—Gas produced by burning sulphur.

Suspensory.—Suspensory bandage, an appliance used for supporting the testicles, made of webbing and similar material.

Suture.—Substance used for sewing.

Swab.—Cotton, gauze, cloth or similar material used for applying medicines locally or cleaning out wounds or cavities.

Symptoms.—The signs of a disease.

Temperature.—The degree of heat.

Testicles.—The two sexual glands which hang in a bag of skin under the penis.

Tincture.—A medicine dissolved in alcohol, or dilute alcohol.

Tissue.—A general term applied to all parts of the body. Almost any part may be called a tissue. For example the muscles, skin, glands, bones, etc. Soft tissues are the soft parts, bony tissues are the hard parts.

Tourniquet.—An appliance for compressing a blood vessel, to prevent bleeding.

Ulcer.—A local open sore.

Ulna.—One of the bones extending from elbow to wrist.

Urethra.—The water passage through the penis from the bladder.

Vaccination.—The prevention of disease by injecting the germs of that disease locally.

Vaccine.—The substance used in vaccination to protect against a disease.

Venous.—Relating to veins.

Venereal Diease.—A disease contracted during sexual intercourse.

Ventilation.—The process of continually supplying fresh air.

Vermiform.—Having the shape of a worm.

Vermin.—Animal parasites. Rats, mice, lice, bedbugs, fleas, etc. Many of them carry disease.

Vitality.—Life.

Yucca.—A tree from which wood for light splints is sometimes obtained.

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